

# COMMERCIAL CAR JOURNAL

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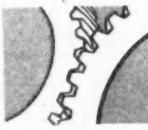
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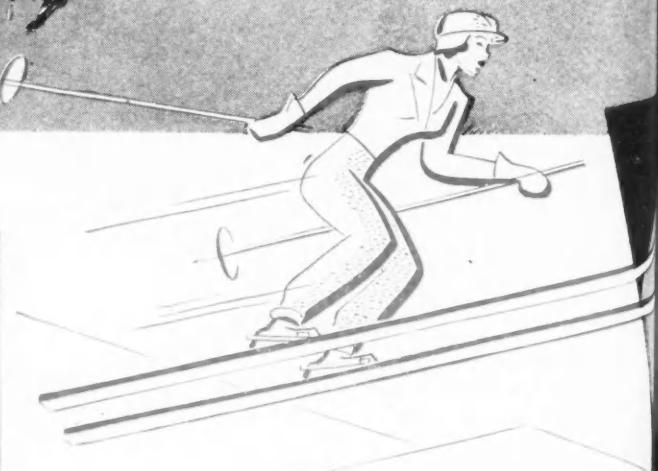
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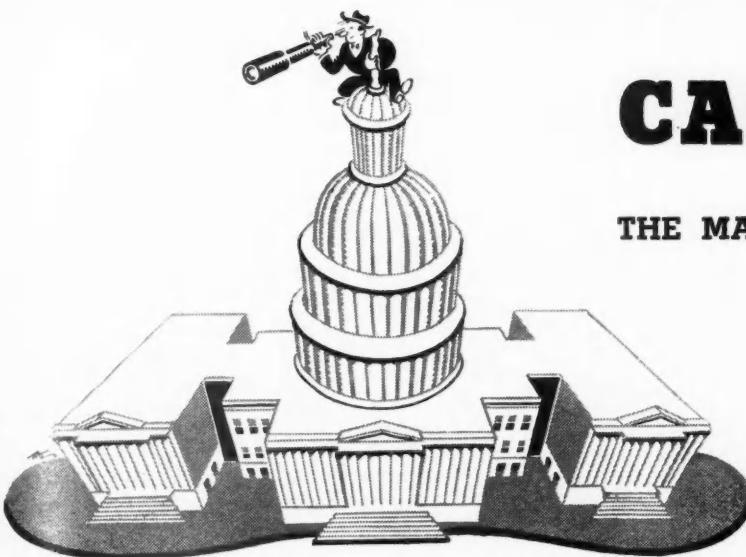


# TEXACO

# COMMERCIAL

## CAR JOURNAL

THE MAGAZINE FOR FLEET OPERATORS



### LEGISLATIVE LOOKOUT

#### Congress and 41 State Legislatures Consider Highway and Carrier Bills Undaunted by Pressure of Defense Issues

**A**S this issue goes to press, 41 state legislative bodies and the Federal Congress are in session. The exceptions are: Alabama, Florida, Georgia, Kentucky, Louisiana, Mississippi and Virginia. Although National Defense measures take precedence over virtually all other matters, let no one think that there is a dearth of other pending legislation, much of which is of vital

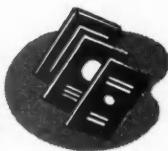
interest to the fleet operator. Already introduced in the new session of the Federal Senate, for instance, is a vitally important bill designed to wrest freight forwarders from the crest of oblivion and put them under the protecting care of the Interstate Commerce Commission.

So once again, COMMERCIAL CAR JOURNAL undertakes to scan, with the help of the National Highway Users

Conference and various trucking associations, the dockets of the various legislative sessions. From the great mass of literature there represented we shall attempt to extract and report on the bills of real interest to fleetmen. For the sake of uniformity and convenience only such bills as have actually been introduced will be mentioned, and then only in barest essentials. In addition, pertinent facts from Governors' messages will be reported as indicative of administration thinking. Readers interested in specific bills may obtain copies from their respective capitals by referring to them by number. If and when the bills are passed, such fact will be reported in these columns but up until this writing none have received such distinction. The following have been introduced thus far:

(TURN TO PAGE 83, PLEASE)

### FREE BOOKS



... a special selection made by the editors ... to get your copy, just check the letter on the post card between pages 128 and 129 which corresponds with the item you desire and mail to Commercial Car Journal, Philadelphia.

#### Sizes & Weights

Once again we call attention to the handy pocket-sized booklet on Truck and

Trailer Size and Weight Restrictions published annually by The Four Wheel Drive Auto Co. Arranged with a separate page for each state, the booklet gives quick facts about each state's truck restrictions. The 1941 edition is now ready. Highly recommended for every fleetman whose trucks traverse state lines. Check "A" on the post card.

#### Armstrong Insulation

A booklet on truck and trailer insulation has just been issued by Armstrong Cork Co. Beyond a general discussion of insulating materials, it includes physical data on Armstrong Corkboard, Temlok and Fiberglas. Highly recommended for all users of refrigerated trucks. Check "B" on the post card.

#### High-Tensile Steel

A well-illustrated 32-page booklet on "Mayari R" a new high-strength, corrosion-resisting steel, has been published by Bethlehem Steel Co. In addition to a breakdown of physical and chemical characteristics of the steel, the booklet describes ways of using it to full advantage. Check "C" on the post card.

#### "Valve Functions"

If you have wondered just what happens when valves get out of shape or out of time, you will be interested in a well-illustrated little booklet just published by Cedar Rapids Engineering Co. entitled, "Valve Functions." The use of the company's Kwik-Way Tapered Arbor or valve pilot is explained. Check "D" on post card.



## AFTER HOURS

**EDITORIAL COMMENT BY GEORGE T. HOOK, EDITOR**

### 1. Large Scale Mergers . . . . . 2. The Same Old Story

#### **Large-Scale Mergers**

Early in January the Interstate Commerce Commission made public its reasons for denying the application of The Transport Co. to effect the largest merger of motor carriers that has ever been attempted.

The reasons were, in themselves, clear-cut. According to the Commission the proposed payments to the motor carriers were excessive; the proposed "take" of the organizers and promoters was unreasonable and unjustified; the proposed contracts providing for employment of certain principal officers of the motor carriers would unnecessarily increase

expenses, would impede organizational flexibility and thus were contrary to the public interest; and the issuance of securities, as proposed, would not be compatible with the public interest.

Mr. Eastman, chairman of the Commission, summed it up this way: "It seems to be a case where, if plans work out according to intent, the vendors (carriers), the promoters and the bankers will all be liberally compensated, very largely with cash, and the investing public will be left holding most of the bag."

In denying the merger application the Commission did not voice its dis-

approval of large-scale motor-carrier mergers in principle. In fact Chairman Eastman said, "I should like to see the experiment tried. I have no hostility to the creation of such a unit. Even if the results were not up to expectations, they would at least be instructive and valuable."

And all the other Commissioners who participated in the decision expressed this pro-merger sentiment: "We believe that unifications of motor carriers are more likely to be on a sound basis, and the prospects of ultimate success improved, if they be brought about through the initiative, and negotiations between the carriers involved, or between persons financially interested in such carriers who retain a substantial interest in the enterprise, without the use of holding company devices or the intervention of promoters, particularly where such intervention would substantially increase ultimate costs."

Those statements are unmistakable evidence that, so far as the Interstate Commerce Commission is concerned, large-scale motor carrier mergers are not taboo.

But the reasons advanced by the Commission for denying The Transport Co. application strike so hard at the motives which inspire large-scale mergers that such consolidations will be taboo in practice, if not in principle. The taboo will work according to very simple formula: Since the element of extremely attractive personal gain and that in terms of hard cash—is removed, promoters and bankers will not waste their peculiar talents and motor carriers

**CCJ**



**QUIZ**



By  
**ROBERT  
F. BAHL**

(Correct Answers on Page 58)

The second semester in the CCJ Quiz College starts this month. See if you can't beat your scores of last term. Again, you get 10 points for every correct answer. Anything above 80 puts you on the Honor Roll. A hundred score gives you the professor's chair.

#### 1.

"Yes, sir! That's the new 'Hi-Tork,'" said Sam, the mechanic, as he showed his boss the features on the new International. Of course, he was referring to . . .

- a. The motor.
- b. The hydraulic brakes.
- c. The clutch.

#### 2.

Have you heard of the unique school conducted by Chevrolet Motor Company? The purpose of this school is . . .

- a. To train sons of dealers to equip them to follow in their fathers' footsteps.

b. To give truck drivers a detailed study of the manufacture and assembly of trucks.

c. To instruct young men in the maintenance and operation of U. S. Army motor equipment.

#### 3.

Another forward step inaugurated by the General Motors consumer research staff has been . . .

a. The issuance of a questionnaire to truck drivers throughout the nation, asking their opinion on the design of trucks.

b. The addition of two "hard-fisted" truck drivers to its personnel.

c. The invitation of representative truck drivers to a conference at Detroit to find out what the drivers themselves wanted in a truck.

#### 4.

Here's a new word that will probably be in everybody's vocabulary soon. It's

will not risk their properties in merger efforts that otherwise will be fraught with an extremely high degree of chance.

The Commission's decision recognized this chance in these words: "...the position of the motor-carrier industry in the transportation field is not yet fully developed. This is particularly true in connection with motor-carrier service such as is here contemplated, much of which would be competitive with rail and water service, and the earnings from which may be adversely affected by any change in the rates of competing forms of transportation. Moreover, the situation with respect to wages paid for labor in part of the area served by these carriers is not yet stabilized to the same degree as in the case of the railroads, and any substantial change in this respect might seriously affect the earnings of the carriers involved."

And Chairman Eastman recognized the chance in these words: "The motor carrier industry is still in its early youth; there is no background of experience by which the probable results of such a unification as is proposed can be gaged, and transportation competition is now so intense as to multiply the hazards of the future. The fact that the vendors (carriers) in the proposed transactions are so insistent that the consideration shall mostly take the form of cash is not reassuring."

There is every likelihood that large-scale, regional consolidations of motor carriers will not be effected for many years to come, if then.

"*Chemigum*." Do you know what it is?  
a. It's a new German ersatz fuel produced from cornstalks.

b. It's a synthetic rubber now being manufactured by Goodyear.  
c. It's a new plastic, as transparent as glass, developed by DuPont.

#### 5.

You know by now that the much-talked-about merger of some 30 trucking companies in the East fell flat. Why?

a. The I.C.C. said "No!"  
b. Kuhn, Loeb & Co. withdrew its financial backing.  
c. The participating companies could not agree on the division of profits.

#### 6.

Sing out the answer to this one. Tell us the most logical place for seeing "Sing-ing Wheels."

#### The Same Old Story

In England highway transport for years past has been subjected to the same railroad-inspired attacks and restrictions as has motor transport in the United States. There, as here, the railroads have been powerful enough to persuade officialdom to play ball with them.

Thus when England went to war the Ministry of Transport, as a matter of policy, effected a substantial transfer of traffic from highways to railroads. Complaints of road haulers were unavailing. However, the bombings by the enemy seem to carry more weight and appear to be eminently more convincing. This has not been admitted officially but it seems to be the logical answer for the complete change of policy that has recently taken place. The Ministry of Transport has decided "as a matter of policy to divert suitable traffics to road transport" in order to relieve congestion that has arisen on the railroads.

Officialdom described the congestion as being due to the great increase in the volume of essential traffic with which the railways are now faced. However, it may be significant that the change of policy occurred after repeated bombings of some of England's most vital western ports and during a period when British shipping was being sunk at an alarming rate and in consequence of which there must have been such a lessening of port traffic as to afford the railroads considerable relief.

There doubtless is congestion on  
(TURN TO PAGE 127, PLEASE)

## EARS TO THE GROUND

#### Re-Rating Ritual

A method of indicating the capacity ratings of motor trucks has been formulated and adopted by the Society of Automotive Engineers. It will be made public March 1. The extent to which truck manufacturers will adopt the method is still in question. We hear some will adopt the method in toto and others in part. Look for the details in the March issue.

#### Six-Cylinder Scent

Reports dealing with the six-cylinder Ford are daily becoming more credible. Some operators, who know a thing or two, tell us it is definitely on the way, but won't give us details. Ford, as is customary, sayeth nothing. In Detroit you hear that the six-cylinder engine is already in production, at the rate of 500 a day. Scores are supposed to be on test in the field.

#### Analyzer Antics

Exhaust gas analyzers are undergoing some improvements to cope with increased air-fuel ratios and minor objections of users. One analyzer, calibrated to read accurately to 16.5 to 1, is well beyond the production stage and should be ready for the market some time this year.

#### Super-Super-Shoes

With its eye on super-highways of the future Goodrich is experimenting with steel, glass, flax and improved varieties of cotton and rayon for making cotton cord that will stand up in tires going at sustained speeds of 75 m.p.h. and higher. The super-highway style for trucks calls for new low-pressure tires.

evidence, depending on geographic sections.  
c. Far more people found drivers likeable than not.

#### 9.

National Defense and Tradition are strange bedfellows. This was demonstrated again when . . .

a. The War Department ended its old practice of requiring motor carriers to submit competitive bids for contracts.  
b. Congress passed a law enabling the President to appropriate private trucks for government use in a national emergency.

c. The I.C.C. was put under the jurisdiction of the War Department.

#### 10.

When you put a dollar's worth of gasoline into the tank, the greatest part of your money goes into . . .

a. Exhaust gas. b. Overcoming friction.  
c. Into propelling the vehicle.

**TIRES**  
... results of experiments with wider rim passenger car tires . . . their advantages and disadvantages . . . and implications with regard to truck tires.

**BRAKES**  
... the problem of equalizing the brakes of truck-tractor and semi-trailer combinations . . . heavy versus light tractors . . . effect on hand controls.

**LUBRICATION**  
... the problems produced by high-output demands . . . the effect of engine design . . . prescription oils . . . service tips for fleet men.

**DIESELS**  
... their status and future . . . directions in which progress will be made . . . the lubrication problems they present . . . recommendations for fleets.

**ANALYZERS**  
... a study of the types of air-fuel checking devices on the market . . . their value and limitations . . . suggestions by fleet service men.

**TOLL ROADS**  
... a highway engineer argues their merits . . . claims they rate a place in the transportation scheme . . . and implies a few "or else" alternatives.



HELD, as usual, in Detroit early last month the annual meeting of the Society of Automotive Engineers stimulated, as usual, many discussions which provided fleetmen, as usual, with frank criticism. The principal food that could be turned immediately into beneficial calories.

But, what was most unusual, many topics of fleet interest were streaked with frantic criticism. The principal speakers approached their meaty subjects in a constructive spirit but time and again they brought down their cleavers and let the chops fall where they could be seen and nibbled, as they subsequently were by discussers. As a result the food was appetizing and received with relish at crowded sessions. Pull up a chair and we'll dish out the choicest morsels.

You are doubtless aware that tires are undergoing a welter of changes and improvements. Simplification of truck sizes, and development of tires with new cotton and rayon cords, with synthetic rubber, and even with glass fibers, are matters of which you may have some knowledge, however slight. But a matter on which you may possess no information whatsoever is the experimental work that has been done with wider rims. It is true the experiments have been restricted to passenger car tires, but they have implications that extend to truck tires, as we shall presently report.

Wide rim development work and testing have been in progress for several years with tire engineers and car engineers cooperating in the work. At Detroit a group of tire en-

## FLEET FODDER

gineers, representing Firestone, Goodrich, Goodyear and U. S. Rubber, reported on their findings. Those findings were such that it is a certainty that tire rims of the future will be wider. Four papers sketched the problem, the solution agreed upon and the results which revealed themselves when the solution was tested.

The problem, briefly, was (1) how can treadwear, which is the outstanding cause of tire removal, be improved on today's vehicles whose greater horsepower and increased speed don't mollycoddle tires; (2) how can the stability of vehicles be improved to provide greater safety at the increased speeds made possible on today's better roads?

The solution agreed upon was a wider foundation for the tire or, specifically, a wider rim. Experiments indicated that for passenger car tires the rims should be from 1-in. to 1½-in. wider. In terms of ratio of rim width to inflated tire width this means a ratio of 75 to 82 per cent instead of the current 60 to 68 per cent. To get an equivalent ride with the wider rims the tests showed that tire pressures should be reduced 2 lb. This did not lower the load carrying capacity of the tire because widening of the rim has an effect closely corresponding to increasing the inflation pressure.

During the past year this solution has been subjected to tests by car engineers and tire engineers over millions of miles of operation and with a variety of tire sizes. The tire engineers' reports showed a general agreement on two principal benefits of the wider rims:

1. A 20 to 22 per cent increase in tire tread life. This is an average of all tests of all companies, under varying conditions. The improvement was found to be greatest under hard driving conditions. One company's range of improvement was 5 per cent for easy conditions up to 80 per cent at maximum speed.

2. Considerably more stability in the car. Steering control and cornering power are definitely improved with wider rims.

It was generally admitted that the wider rim would be no more exposed to curb damage, but drivers could avoid this by getting into the same habit as drivers of cars with white sidewall tires.

A majority opinion indicated that wider rims were also favorable to better tire durability. One engineer said rim widening was not necessarily favorable in this respect and pointed to the greater strain on tire beads with the likelihood of early failure. Another tire man countered that while this weakness showed up in tests, new flanges were developed which provided greater bead support.

It was admitted that the wider rims made parking effort and steering at slow speeds slightly inferior, and that the major disadvantage was the harsher ride. In regard to the latter it was pointed out that car engineers could possibly make certain changes in the chassis to improve riding comfort that would not be possible without the greater inherent stability offered by wide rim tires.

In the discussion, J. E. Hale, manager of the development department

of Firestone, emphasized the need for simplification of rim types, rim widths and tire sizes in order to effect sound engineering of tires. He said the variety of combinations now in existence compelled compromises which are not always in the best interests of safety. In the case of wider rims, he said a proper combination of rim flange and tire bead was necessary for maximum safety.

Car engineers were called on and all of them agreed with the favorable reports made by the speakers and expressed themselves satisfied with the potentialities of the wider rims.

T. C. Smith, of the American Telephone & Telegraph Co., arose to inquire if the wider rims represented a tire changeover problem that would be prohibitive in the case of large fleets, and whether the wider rims provided benefits in slow speed service.

The answers given him were: The same tires can be used on the wider rims as on rims currently in use. Consequently there is no tire changeover problem. The benefits in slow speed operation are neither as great nor as certain as in high speed service. Fleets would have to experiment to ascertain if wider rims would prove economical in their slow speed operations.

Another question raised was the effect the wider rims with a 2-lb. reduction in tire pressure would have on gasoline mileage. The answer given was that the 2-lb. reduction in pressure made no appreciable difference in the rolling resistance and, therefore, economy was not affected.

To those who wondered if under  
(TURN TO PAGE 96, PLEASE)

## FROM SAE FORUM

by GEORGE T. HOOK

Editor, Commercial Car Journal

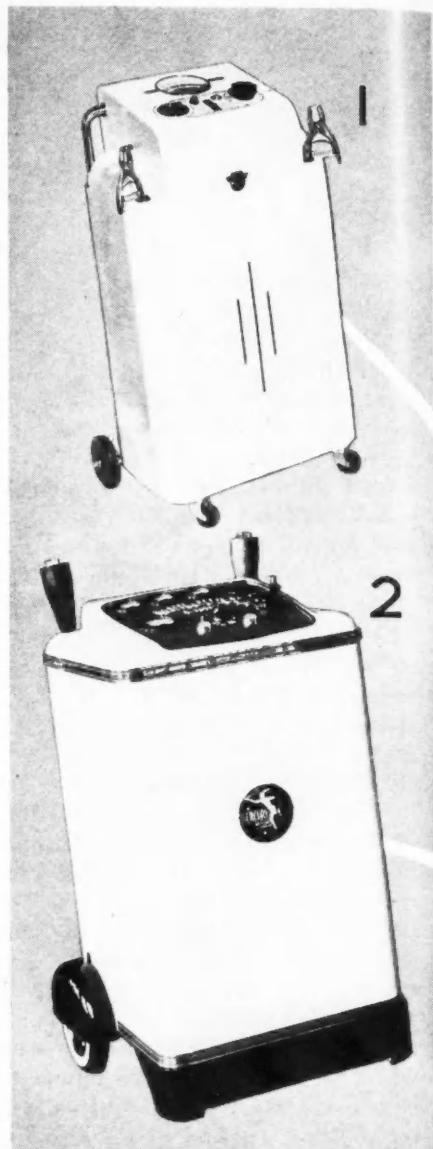


# A CHECK-UP OF FAST CHARGERS

New devices speed up charging of run-down batteries, revitalizing them for service in 20 to 80 min.

by HENRY JENNINGS

Technical Editor, Commercial Car Journal



Fast chargers are a relatively new development in the automotive service field. Commercial Car Journal began digging some time ago to find out what makes fast chargers tick; what they cost to own; what they cost to operate; what they do to batteries; what they bring to the fleet field in the way of benefits. This article answers all these questions and represents the first comprehensive study made by any publication of this new service development.



UNLESS you live in the Middle West there is a more than fair chance that you have not heard much about fast battery chargers. Just a few years ago fast battery chargers were unheard of anywhere. But this Middle Western development from an obscure beginning has claimed a popularity that has spread like a prairie fire and now has come to rest at both seaboards with all of the serenity of a cyclone. At present there are no less than 13 manufacturers of battery chargers that will charge a battery in maximum time of 1 hr. and 20 min. and perhaps in as short a time as 20 min. If your automotive jobber has not invited you to look at the one he distributes, he soon will.

Strangely enough the first phase of



1. Speedway, 2. Mercury, 3. Handy, 4. B-L Supercharger, 5. Rocket, 6. King, 7. Allen, 8. General Electric. For manufacturers' names see table on page 25

the "how come" does not concern the new equipment but the batteries. The first question that occurs to the mechanically minded is what has happened to the battery that makes fast charging permissible when for years we have heard that charging a battery too fast would ruin it? The collective answer we give you has been pieced together and repre-

sents the opinion of a number of battery manufacturers and fast charger manufacturers.

The batteries have been improved. Not that the battery manufacturers had fast charging in mind when they made the various improvements, but to make the battery product more usable in other directions they inadvertently wound up with a battery

that could be charged at a much faster rate than before. It has been pointed out by a number of sources that a number of years ago the vehicle generator was capable of charging the battery at the rate of perhaps 12 amp. With current demands increasing as a result of more electrical gadgets and more severe cranking loads it became necessary to build a battery that would accept a faster charge and to equip the vehicle with a generator of greater capacity.

The fast charger manufacturers point to the fact that charging the battery in the garage has been done at the same old rate of about 12 amp. while it is charged in the vehicle by the car generator at rates as high as 40 amp. and on some special installations

(TURN TO NEXT PAGE, PLEASE)

## A CHECK-UP OF FAST CHARGERS—

(CONTINUED FROM PAGE 23)

tions as high as 60 amp. Thus the battery gets charged over three times as fast in the vehicle as it does by the old style garage charger. All the charger makers did was to take a page from the book of the car generator manufacturer. They made garage chargers that had even more capacity than the car generators. Most of the new fast chargers have about twice the capacity of the car generators and some of them have three times as much. They will not charge a battery fully at the fast rate. They give it a boost to about 1250 specific gravity.

Do the fast chargers represent any revolutionary engineering? The answer is "no." Fast chargers are not even patentable. There are four types of fast chargers—the motor generator, the bulb rectifier, the copper sulphide rectifier and the copper oxide rectifier. Not one of them represents a new idea. We do not wish to imply that the engineering departments of the fast charger manufacturers have been loafing. We do wish to convey the idea that motor generators and bulb rectifiers have been used for battery charging and that both copper oxide and copper sulphide rectifiers have been used industrially for changing AC current into DC current, notably on motion picture projection equipment. The engineers undoubtedly deserve a great deal of credit for adapting the equipment to fast battery charging but they made no great new discovery. They have tailored existing devices to the requirements at hand.

When they finished they had a creation that charged a battery at a much faster rate than did conventional garage chargers. Since it is important that the amount of time that a battery is subjected to the high rate of charge be limited, the fast charger is equipped with automatic cut-off switches in some cases. The engineers have added ammeters and voltmeters in order to make immediate tests of the battery without refer-

ence to other equipment and also as visual indication of what the fast charger is doing when it is in action. The whole thing is mounted on casters to make it portable and covered with sheet metal to improve its appearance.

What do the battery manufacturers think of fast chargers? So far as we are able to determine, none of them has got out of breath rushing endorsements into the mail, but on the other hand we have been unable to locate even one battery manufacturer who is opposing them. Our own opinion, if you care for it, is that the development involves not only the fast charger but also how properly mechanics will use it, and so the battery manufacturers are sitting back and waiting to see what happens. They will be able to say whatever they have to say much more comfortably after some experience has been compiled.

Whatever else the fast chargers are they are not foolproof. It is possible, if the mechanic disregards instructions and recommended charging procedure, to ruin the battery. The fast charger manufacturers say, in effect, that the mechanic is now playing with a lot of current and he must learn to do it right. Lest this be construed as meaning that the mechanic must burn a lot of midnight oil before he dares to charge a battery, we hasten to assure you that the instructions are quite simple and if you concentrate you can get them the first time. Not that a little experience will hurt you. Nevertheless the recommended procedure must be accurately followed and it includes careful hydrometer readings with electrolyte at proper level and corrections for temperature of the electrolyte determined by thermometer readings.

In this connection it is interesting that some trouble has been encountered in setting their machines for the proper charge as a result of the shortcomings of hydrometers. The average battery hydrometer reads

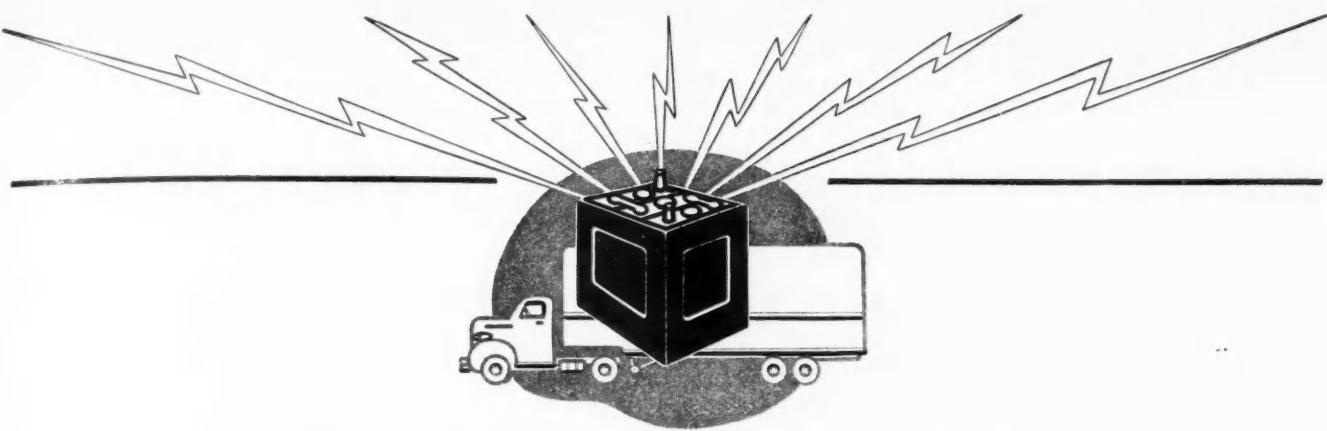


9. Quick Charge, 10. Foreman



only as low as 1140. When the hydrometer inside fails to float the mechanic knows only that the specific gravity of the battery is below 1140. Some of the batteries encountered have a specific gravity considerably below that point and the time on charge is based on the specific gravity. Hence it was impossible to determine the setting. New hydrometers reading as low as 1060 will soon prevent confusion on this point.

If the time on charge, which is



## Specifications of Fast Battery Chargers

Name	Model	Price	Type	Timing Device	Cut-Off Switch	Charging Rate	Ammeter to Show Rate of Charge	Voltmeter to Show Battery Voltage	Rate of Charge at Start	Rate of Charge at Finish	Available in What Voltages	Available in What Cycles
Allen Electric & Equip. Co.												
Alien.....	F160	159.00	CS	M	Au	Ad	Y	Y	80 Max.	60	110,220	25,30,50,60
Baldor Electric Co.												
Handy.....	75	180.00	B	M	Au	Ad	Y	Y	70-75	6	115,230	50,60
Benwood Linze Co.												
B-L.....	39/40	249.50	CO	M	Au	Ad	Y	Y	100 Max.	12-15	110,220	25,60
B-L.....	200	199.50	CO	M	Au	Ad	Y	Y	100 Max.	12-15	110,220	25,60
B-L.....	100	98.50	B	M	Au	F	N	N	50	50	110	60
Electric Heat Control Co.												
King.....	FG-1	178.00	CS	M	Au	Ad	Y	Y	80 Max.	60	110,220	60
W. D. Foreman												
Foreman Booster.....	A-75	147.50	MG	M	Au	F	Y	N	75	55	All	All
Foreman Booster.....	D-75	176.50	MG	M	Au	F	Y	N	75	55	All	All
General Electric Co.												
GE.....	Deluxe	325.00	CO	E	Au	Ad	Y	Y	20-100	15	110,220	60
GE.....	Eighty	189.50	CO	E	Au	Ad	Y	Y	35-80	30-70	110,220	60
GE.....	Booster	89.50	B	M	Au	F	Y	N	40	35-40	110,220	60
Hunter Hartman Corp.												
KwiKurent Deluxe.....	372K	545.00	MG	M	Au	Ad	Y	Y	150 Max.	70	220,440	25,50,60
KwiKurent Standard.....	365K	495.00	MG	M	Au	Ad	Y	Y	150 Max.	70	220,440	25,50,60
Rocket.....	472R	265.00	CO	M	Au	Ad	Y	Y	90 Max.	72	110,220	25,50,60
Bullet.....	465B	179.50	CS	M	Au	Ad	Y	Y	80 Max.	64	110	60
Mercury Battery Charger & Tester Corp.												
Mercury.....	Master	295.00	SE	M	Au	Ad	Y	Y	110 Max.	60	110,220	25,50,60
Mercury.....	100	198.50	CO	M	Au	Ad	Y	Y	90 Max.	50	110,220	25,50,60
Mercury.....	Comet	124.95	CS	M	Au	Ad	Y	N	75 Max.	40	110,220	25,50,60
Marquette Mfg. Co.												
Marquette Hi-Rate.....	100 Amp.	198.00	CO	M	Au	Ad	Y	Y	100 Max.	60-70	110,220	.....
Marquette Hi-Rate.....	80 Amp.	179.50	CO	M	Au	Ad	Y	Y	80 Max.	50-60	110,220	.....
National Battery Co.												
Speedway.....	0694	197.50	CO	M	Au	Ad	Y	Y	100 Max.	60-70	110,220	25,60
Speedway.....	0693	179.50	CO	M	Au	Ad	Y	Y	80 Max.	50-60	110,220	25,60
Quick Charge, Inc.												
Quick Charge.....	80-A	198.50	CS	M	Au	Ad	Y	Y	80 Max.	50	115,220	25,60
Joseph Weidenhoff, Inc.												
Weidenhoff.....	555	186.50	CS	M	Au	Ad	Y	Y	80 Max.	25-30	110,220	50,60

Ad—Adjustable  
Au—Automatic

B—Bulb  
CO—Copper Oxide

CS—Copper Sulphide  
E—Electric

F—Fixed  
M—Mechanical

MG—Motor Generator  
N—No

SE—Selenium  
Y—Yes

based on specific gravity, is not correctly set, one of two things will happen. If the fast charger is set for too short a time the battery will not get as much of a charge as it should. The result is exactly the same as if it were taken off a slow charger too soon. If the charger is set for too long a time the battery will get the fast charge for too long a period which will result in excessive gassing.

Excessive gassing itself is an indication that much of the current you

are putting into the battery is being wasted. Instead of being stored as an electrical charge it is being used to separate the electrolyte chemically and turn it into a gas. In such an event, it is possible to waste as much as 90 per cent of the current going into a battery, so you can see that hydrometer readings as accurate as possible are necessary if the fast chargers are to be used to advantage.

The hydrometer reading is correct at only one temperature but just

what that temperature is, is a matter of dispute. Some battery manufacturers use correction thermometers with a zero correction at 70 deg. F., some use 77 deg. F., and some think 80 deg. F. needs no correction. This need not be a problem of yours since the correction for the first 10 deg. either way is 3.5 on the specific gravity scale and you cannot read a hydrometer that accurately. We tell you about it only so you will not be

(TURN TO PAGE 60, PLEASE)



# **ARMY SAYS "OK" TO BASIC TRUCK MODELS**

**An account of the Army's truck set-up giving types, numbers and use**

**by MAJOR GENERAL E. B. GREGORY**

Quartermaster General, United States Army



**I**T is our aim to keep our motorization policy as definite as possible and, at the same time, to keep it flexible so that there will be room for experimentation with, and testing and adoption of, new ideas.

The extensive use of motor transportation by our Army is essential to the rapid movement of personnel and equipment, a fundamental principle of modern warfare. Today campaigns are being fought and won in Europe and the Near East by rapid movement of troops and their timely supply of ammunition and food, by quick encirclement and envelopment of hostile flanks, by pursuit of the retreating enemy and by the seizure of his rear and lateral communications — a campaign strategy now known as the "Blitzkrieg."

War strikes quickly these days and frequently without warning. Any peacetime system of military motor transportation which is much different from that to be used in war will be sure to result in delay and confusion in the early stages of the conflict, and may seriously affect the final outcome, as we have seen happen during recent years in Europe.

A fast and reliable system of motor movement was a vitally important factor in the German conquest of France and the Low Countries. In that campaign, *all* German supply was carried by motor. Activity in the repairs of wrecked railroads was not even attempted during the early stages of this conflict. We have read that a German system of fuel and oil supply lines were actually laid on the ground from one temporary fuel depot to another, to keep up with the forward advance of vehicles. Without motor vehicles carrying troops and supplies, the word "Blitzkrieg" would hardly be known.

The tremendous problem of equipping our steadily growing Army with vehicles capable of performing the multitude of duties imposed by modern warfare is, chiefly, the selection and procurement of the type of equipment which will be able to do the work but still be adaptable to volume production. At the same time, we must accomplish this with as few

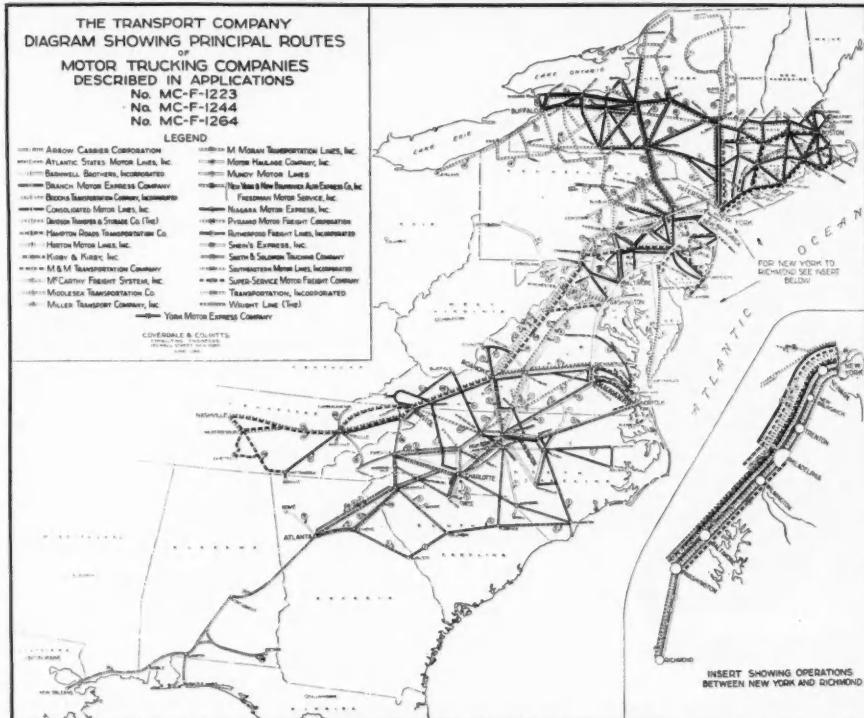
(TURN TO PAGE 84, PLEASE)

**T**O all intents and purposes the \$25,000,000 dream of Transport Co., New York, for a huge combine of eastern motor carriers, truck rental agencies and truck manufacturing concerns is dead. The very unanimity of the Interstate Commerce Commission's decision, against the deal, reported in brief a month ago, had an air of complete finality. But the 76-page report, recently released, which gives the commission's full reasoning goes still further to strengthen the case against large-scale mergers. Nowhere does the report stray from the points raised by this specific case, yet there can be little doubt in the minds of transportation men that the commission's thinking on the Transport Co. case, is the commissions thinking on the principle of large-scale truck mergers.

In short the ICC does not like the financial set up of the merger plan, it doubts that service will be improved, it strongly objects to the interrelationship proposed between common and contract carriers and truck rental agencies and it has a distinct aversion to issuing in effect a "blank check" to Transport Co. to effect a "singleness of application sometime in the future." In detail its reasoning was developed as follows:

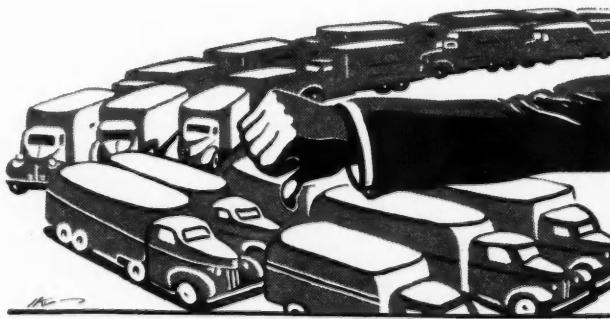
First came the matter of jurisdiction. When Transport Co. came into being in November, 1939, it was purely a holding company and the ICC neither has jurisdiction over the proceedings of such a concern nor can it approve a carrier's certificate for such an applicant. But the commission does have authority over the functions of common carriers, including the purchase of one carrier by another. So on Oct. 11, 1940, Transport Co. leased the properties and operating rights of Arrow Carrier Corp., Patterson, N. J. (one of the several companies involved in the proposed merger) and thus became a common carrier. The ICC then promptly acknowledged jurisdiction over the merger proceedings in so far as they involved common carriers, but it never did assume jurisdiction over the truck rental and manufacturing interests involved in the deal.

Having thus established its jurisdiction (TURN TO PAGE 90, PLEASE)

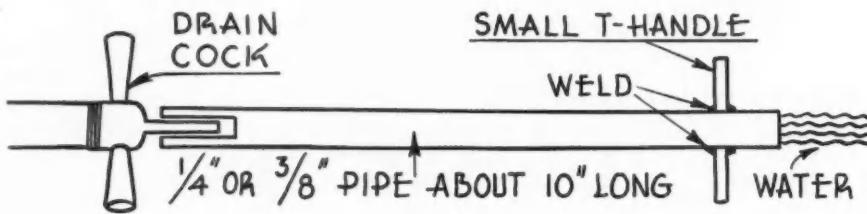


## ICC SAYS "NO" TO LARGE-SCALE MERGERS

**Decision in Transport Co. case offers no encouragement to promoters**



Commercial Car Journal pays \$5 for each shop hint accepted for publication on these pages. Simply send in the idea which you believe to be original. Don't worry about style. Acceptance is based on the idea. CCJ will edit it for publication

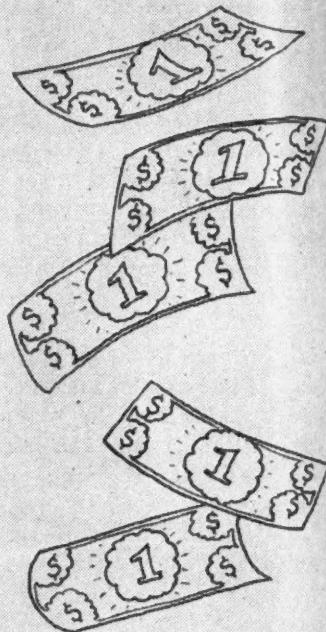


**Drain Cock Tool**  
By William C. Acker  
San Francisco, Cal.

We have a very handy tool for draining water from the cooling system of a Chevrolet without getting water down your sleeve. It is made from a 10 in. length of  $\frac{1}{4}$  or  $\frac{3}{8}$  in.

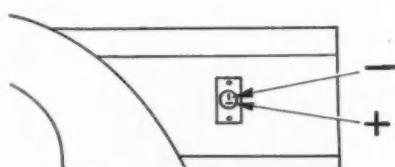
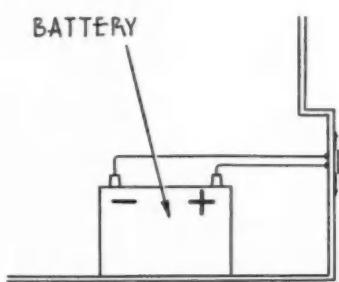
pipe. The pipe is slotted at one end to fit the drain plug wing nut and a small Tee handle is welded to the other end. Thus when the valve is open the water runs down through the pipe and into the drain pan saving yourself from getting wet and perhaps even burned.

# CAN



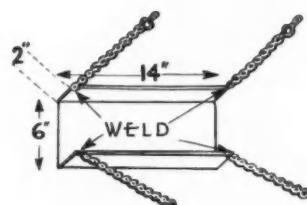
## SHOP HINTS

FROM



**Battery Connector**  
By Gerald Reed  
Arrow Trucking Service, Fishers Landing, N. Y.

We have a conventional wall type battery charger and our storage garage is unheated. When the temperature is below zero it is uncomfortable to wrestle batteries around so I have made a permanent battery connection for charging without removing the battery. While I have not done it it would be easy to install a DC socket in the truck splash pan instead of the two lead connections so that a simple plug-in would set the batteries to charging. The DC plug prevents connections from being reversed.



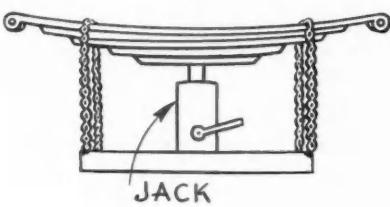
**Portable Press**  
By Earl Ziegenbein  
Duluth White Co., Duluth, Minn.

We have made a portable press which we have found to be very handy for a number of uses, including compressing a spring to install a center bolt and pushing out spring clips. It is made of a piece of chan-

**YOU USE**



**F L E E T   S H O P S**

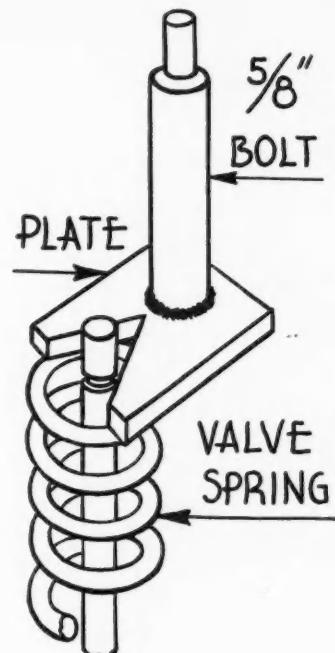


nel iron 14 in. long, 6 in. wide with channel side 2 in. high. At each corner of the channel we have welded a length of chain strong enough to handle any kind of work. We use two 3 to 4-ft. lengths of  $\frac{3}{8}$ -in. chain on one side and two 10-in. lengths of  $\frac{3}{8}$ -in. chain on the other side. Then we have equipped the chain with a

catch so that the loop may be made in any size to fit any job.

**Trouble Light**  
By William C. Acker  
San Francisco, Cal.

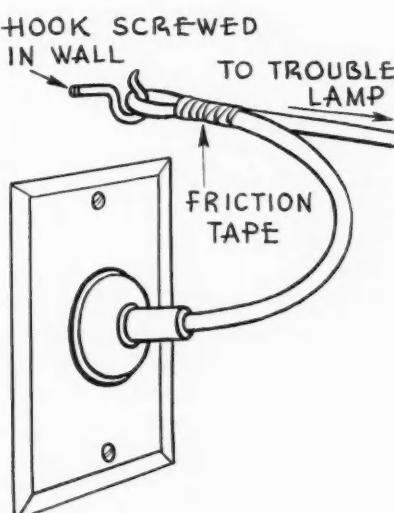
Everyone yells about trouble cords pulling out of the socket but no one does anything about it. Here's one idea. Screw a small hook into the wall just above the socket. Take the trouble cord and make a small loop in it just above the plug. Tape this loop into the cord with a length of friction tape. When you plug into the socket, drop the loop over the hook and you will never pull the cord out of the socket again.



#### Valve Lifter

By William C. Acker  
• San Francisco, Cal.

I do not know of any valve lifter that will equal a drill press for overhead valves. The drill press must be equipped with the tool shown. It is an ordinary  $\frac{5}{8}$ -in. bolt welded to a  $\frac{1}{4}$ -in. plate with a Vee cut at the front of the plate to clear the valve stem. The part of the bolt that fits up into the chuck should be turned enough to provide a small shoulder so that the bolt will not be forced up into the chuck when depressing a spring. The Vee and the bolt should be as close together as possible to prevent damage to the drill press from side thrust.





## EDITOR'S NOTE

Here is the third in a new series of unusual body designs that are actually in service and which have been developed by, and often made within, the shops of Commercial Car Journal fleet readers. To Edward Chadwick, fleet manager of the Little Falls Laundry, Little Falls, N. J., goes credit for this unusual design and thanks for the photographs and details herewith.

Fleet readers are invited to contribute to this department by sending in evidence of unusual body designs which may have been created to meet specific needs. Next month—a spectacular, highly-specialized body.



# THE BODY OF THE FOR LAUNDRY

**A**N all-aluminum multi-stop body of 537 cu. ft. of loading space, especially adapted for laundry delivery, has been developed and put into operation by Edward Chadwick, fleet manager of the Little Falls Laundry, Little Falls, N. J. It is mounted on a converted Ford 1½-ton chassis.

The overall length of the truck is 19 ft., while the inside length back of the driver's seat is 12 ft. The body is 77½ in. wide and the height is 75 in. This gives a cubic foot capacity of 487, and with the 50 cu. ft. to the right and alongside the driver, the total comes to 537. This is about the same number of cubic feet of body on a 134-in. Ford chassis as the older bodies mounted on a 156-in. chassis had.

Obviously, the purpose in using aluminum was to reduce weight. The original idea was to build a chassisless truck. However, upon analyzing the design, it proved more practical to use the shorter Ford chassis and make an individually designed front

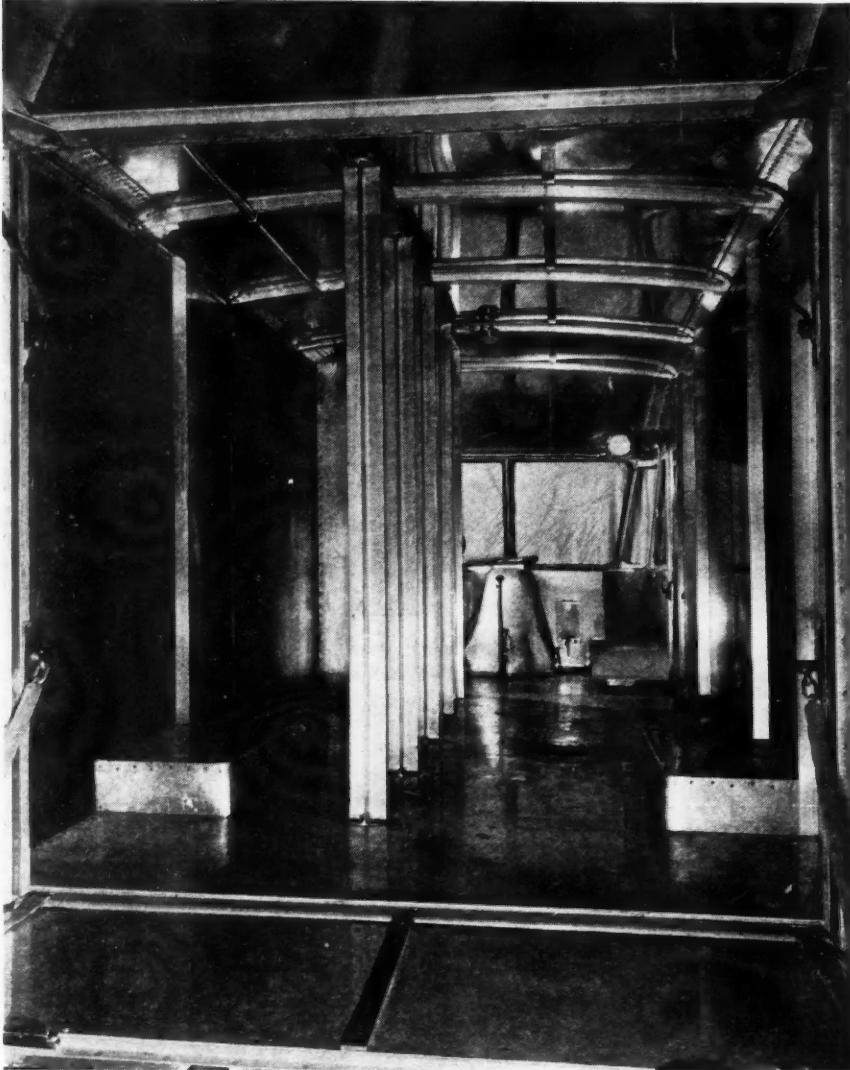
end so that the steering, engine and controls were inside the body. The entire unit weighs 5220 lb., against previous models of the same loading space which weigh 7070 lb., for a saving of 1850 lb.

Standard pedals were used in the conversion. It was necessary to saw off the equipment pedals and mount another set forward on brackets about 4 in. to the left of the original set. The mounting was made on a subframe. In changing the steering, it was moved forward 31½ in., using the standard Ford drag link and Pitman arm, but reversed. A separate housing was built to hold the steering post rigidly to the front frame of the truck.

Since the steering was mounted rigidly to the chassis, it was necessary to allow for distortion and weaving, since the front of the body was rocker mounted. The front wheels were jacked up to see how much clearance would be necessary. The steering post moved 7/8 in. off center when

either front wheel was jacked up 6 in. In tying the post to the cowl it was necessary to consider clearance, so 1¼ in. on each side was left on each side to take care of the weaving without tearing something loose or damaging the front end of the body as it would do if it were rigidly mounted to the body. The reason for the rocker mounting of the body at the front end is to prevent breakage of glass or damage to aluminum panels in the case of frame movement.

The engine hood is lined with asbestos to keep engine heat from the body interior. Two interior ventilators are placed inside the cowl section of the body, invisible from the outside, since baffles are used to distribute the air when it comes in through the front grill. Removal of one pin makes the whole engine accessible. The floor, too, is hinged on the right for making minor adjustments. The battery and brake cylinder are under floor plates just behind the engine. All switches have been



# MONTH

## DELIVERY

placed on the panel immediately in front of the driver.

One of the most striking features of the truck is the wide range of visibility. All window glass is rounded at the corners, no sharp angular projections being present whatsoever, thus contributing to the general streamline effect of the entire body.

The grill is constructed of chrome, especially designed, and is easily removable for engine replacement when necessary. Lights, too, are accessible for mechanical adjustments by merely removing the hood; ventilators, likewise. The truck is streamlined in design and appears in a two-tone green combination. Veenema & Wiegers, specialists in aluminum construction, built the body.

From preliminary tests, it is apparent that one of the outstanding benefits of this new type of vehicle will be an appreciable saving in gasoline. When the fact is taken into consideration that the Little Falls total annual

(TURN TO PAGE 82, PLEASE)



The unusual appearance of this all-aluminum multi-stop body is shown by the front-end view (far left) and the side view (above). The remaining photos give some idea of the interior arrangement. Note that by removal of the inside engine hood, the entire engine becomes accessible. The dry cleaning compartment at left is shielded at front end in case the door is left open



Above: A class in Vehicle Fleet Safety. Instructors (standing l. to r.) are: C. G. Morgan, Jr., ATA; H. L. Carr, International Harvester; J. G. Hayden; Harold Willings, Huber & Huber, and Fred Lautzenhiser, International.

# COLLEGE COURSE IN SAFETY

All fleetmen can benefit from ideas developed at training school sponsored by National Safety Council



by **JAMES G. HAYDEN**  
Fleet Engineer, National Safety Council

WHAT practical problems in accident control would a group of alert Safety and Personnel Directors for motor vehicle fleets most like to learn about during a get-together week of study?

That was the advance question considered by the sponsors of the Second Annual Course in Vehicle Fleet Safety, held recently at the University of Tennessee in Knoxville. This course was one of nine given in conjunction with the 1940 National Institute for Traffic Safety Training, which drew a total enrollment of more than 200 students from 30 states. The sessions were held in college classrooms. Outside of room and board, the only charge to the students was a tuition of \$10.00 per week. All students successfully completing their courses were given engraved certificates. Enrollment in the Course on Vehicle Fleet Safety was about equally divided between fleet officials and insurance company representatives.

One early discussion was on the minimum size of fleet which could afford a full-time Safety Director. The class first agreed that some one person must be made responsible for safety to get permanent fleet results. It was decided that a full-time safety and personnel man ordinarily could  
(TURN TO PAGE 116, PLEASE)

Symbol	"OFFICIAL TRUCKING EQUIPMENT REGISTER"								General Offices:	
	Name of Carrier				Date:		Dept. of Operation:			
Make of	Type	Yr.	Length	Width	Height	Rear	Side	Cu. Ft.	Weight	MISC. COMMENT
1 SUPER	OPEN TOP BODY	1936	28 ft.	7½ ft	7½ ft	GATE	NO	1540	20,000	BULK COMMODITIES
2 COLOSSAL	CLOSED BODY	1938	24 ft	7½ ft	7 ft	SEALED	NO	1230	18,000	MERCHANDISE, ETC.
3						DOOR				
4										
5	OPTIONAL,									
6	PURCHASES OF NEW EQUIPMENT CAN BE SHOWN ON A SUPPLEMENT OR A REISSUE									

16					-MAINTENANCE EQUIPMENT-					
17	TERRIFIC	PATROL CARS	1938					X	X	
18		REPAIR CARS	1938							
19		WRECKERS, ETC.								
20										
21		CONDITIONING, REPAIRING REPORT ISSUED IN SUPPLEMENT								
22		FORM BY REFERENCE TO NO. 1 OR 3 TRUCK, ETC.								
23										

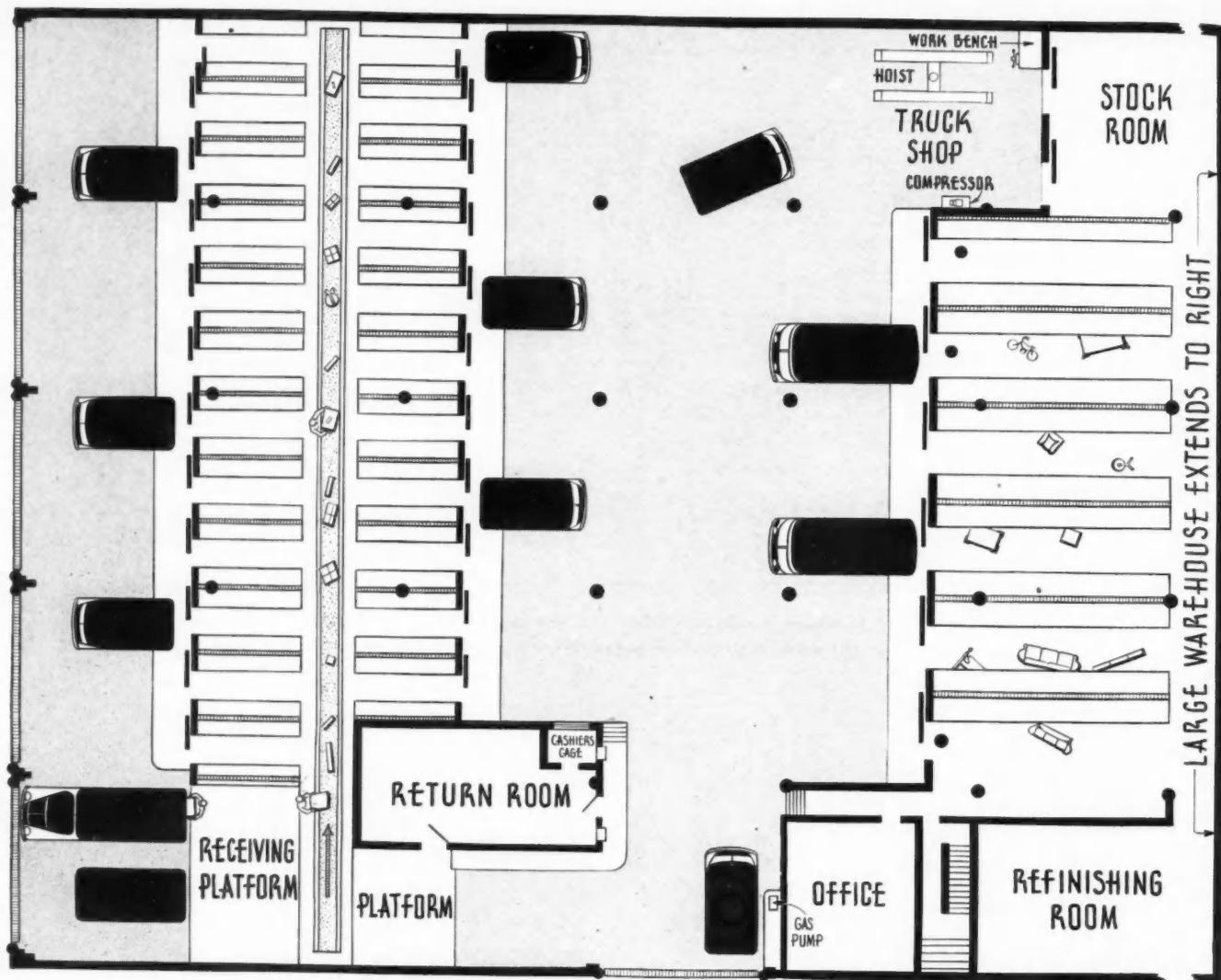
Above: Suggested form for "Official Trucking Equipment Register" as suggested and described in accompanying article. Its purpose: To provide traffic managers with quick facts about available truck equipment

## SELL YOUR EQUIPMENT

An industrial traffic man tells why he needs more data on available equipment of motor carriers



by ERNEST RUSCH  
Assistant Traffic Manager, New York



## STORE RESTORES FLEET



Washington department store abandons consolidated delivery in favor of its own modern fleet and cuts two cents off the per-package cost

by BART RAWSON

MAINTENANCE HISTORY		RD. CALLS	DAY	REASON	JANUARY	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEPT.	OCT.	NOV.	DEC.				
P.M. A	P.M. B				DAY	AT.	M.	GAS	OIL	DAY	AT.	M.	GAS	OIL	DAY	AT.	M.	GAS	OIL	
OIL CHANGE																				
AXLES					1					2										
DIFFERENTIAL					3					4										
BRAKES					5					6										
CLUTCH					7					8										
RADIATOR					9					10										
Hoses					11					12										
W. PUMP					13					14										
F. PUMP					15					16										
GENERATOR					17					18										
STARTER					19					20										
SPARK PLUGS					21					22										
DISTRIBUTOR					23					24										
POINTS					25					26										
CONDENSER					27					28										
H. BEARINGS					29					30										
I. BEARINGS					31					TOT.										
PISTONS																				
RINGS																				
PINS																				
VALVES																				
CARBURETOR																				
W. BEARINGS																				
SPRINGS																				
STEERING																				
TRANSMISSION																				
BODY REP.																				
FENDER REP.																				
PAINT																				
GLASS																				
LIGHTS																				
BATTERY																				
SPEEDOMETER																				
CYL. HEAD																				
COST OF REPAIRS		ODOM. END OF MO.	SUMMARY	JANUARY	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEPT.	OCT.	NOV.	DEC.					
MO.	DESCRIPTION	COST	MILES RUN	GALLONS GAS	QUARTS OIL	MI. PER CAR DAY	MI. PER GAL. GAS	MI. PER QT. OIL	DAYS IN SERVICE	GAS COST	OIL COST	TIRES & REPAIRS	DEPRECIATION	LICENSE & INS.	INTEREST	RENT - LIGHT	LUBRICANTS	LABOR	COST PER MI.	COST PER CAR DAY
JAN																				
FEB.																				
MAR.																				
APR.																				
MAY																				
JUNE																				
JULY																				
AUG.																				
SEPT.																				
OCT.																				
NOV.																				
DEC.																				
TOTAL REPAIR COST																				
TOTAL LABOR COST (PRORATED)																				
TOTAL REPAIR & LABOR COST																				
TOTAL YEAR MILEAGE																				
COST OF MAINT. PER MI.																				

Far left: Lansburgh's modern warehouse-garage was specially built to streamline the delivery operation. Note receiving platform where packages arrive from the main store and conveyor to individual route bins. Left: A maintenance history is kept of each truck in the fleet. Columns for each month on the year extend to right. See text for full details.

beat even the 10½ cent rate on their own, provided they had a modern, efficiently managed fleet. Their decision was the more impressive when viewed in the light that Lansburgh's at that time had a smaller volume than any of its competitors, and that a new warehouse-garage was needed in addition to a whole new fleet of trucks.

That the decision was right is proved by the record. During the last six months of 1939 the cost per package was down to 8½ cents (again excluding parcel post, freight and express). Simple arithmetic shows that on a basis of 1,100,000 packages this constitutes an annual saving over the old consolidated figure in the neighborhood of \$22,000. In the meanwhile the store volume had increased another 100,000 packages making the savings still greater. Even then the process of streamlining the delivery fleet was not complete and now for the last few months of 1940, the store anticipated a straight 8 cents as its delivery rate.

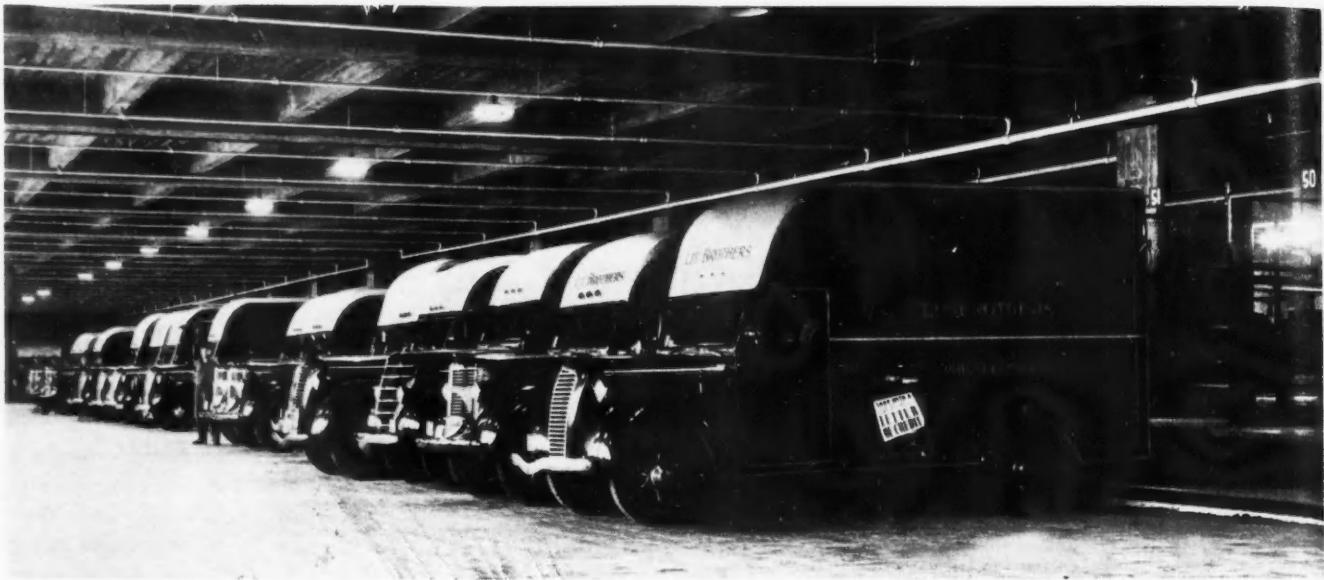
The first step in outfitting the new fleet was an initial purchase of a number of new cab-over-engine package-type delivery trucks. Additional trucks, soon to be replaced with new equipment similar to the initial order were repurchased from the consolidated delivery service.

Former Lansburgh drivers, given the opportunity of coming back from the consolidated service at a base pay \$3.00 a week higher than they were currently making, filled the bulk of driver positions. Additional vacancies were filled by new drivers hired on a basis of personality, general intelligence, and driver ability. Except in rare instances all drivers are required to be residents of the district for at least five years and thus to

(TURN TO PAGE 64, PLEASE)

## WITH PROFIT

  
THE story of how a medium-sized department store, delivering an average of just over a million packages a year, is able to run its own delivery system more economically than it could buy the service from a consolidated delivery and at the same time cash in on the extra value of having its own trucks on the street and its own well-trained drivers as customer contact men for the store, is to be found in the delivery operations of Lansburgh & Bro., Washington, D. C.



Above: One of three driveways inside the new Lit Brothers warehouse in Philadelphia, from which delivery trucks are loaded for daily routes

## RETAILERS TALK TRUCKS

**Store executives emphasize use of motor carriers, review forwarder status and own delivery systems**

**P**ROPRIETOR selection of available transportation facilities as a means of effectually reducing the cost as well as time in transit of incoming shipments occupied an important place in the discussions of the delivery and traffic groups of the National Retail Dry Goods Association, meeting in New York, Jan. 13 to 17. Throughout the discussion the superior performance of motor carrier service was very much in evidence.

Telling of his excellent second-morning delivery of motor shipments out of New York, 950 miles away, Phillip S. Day, traffic manager of The

Cain-Sloan Co., Nashville, Tenn., said that virtually all his minimum shipments from the eastern seaboard were routed through his New York City consolidator. Each night as the truck leaves the consolidation loading dock, a special form telling what is on the truck is air-mailed to Nashville. The form is then posted in the store the next morning so that buyers may know exactly what shipments they can expect to be in their hand at store opening the following morning.

Comparing his cost and time in shipments by various routes, Mr. Day used as an example a 40-lb. shipment

from Portland, Me. By rail express, it took three days and cost \$2.26. By freight forwarder direct, it took five days and cost \$2.13. By express to the New York consolidator and then by motor freight, it took three days and cost \$1.72. In this case the time was the same as by direct rail express, but the cost reduced by 54 cents.

The study of incoming transportation charges reached a high point in the case of a midwest store whose name was revealed at the meeting but withheld from publication by special request. A. C. Morse, of Remington Rand Co., New York, told how this store had invested nearly \$2000 in visible index equipment for the sole purpose of keeping an accurate check on transportation charges. Each order from the store is accompanied by detailed instructions for shipping route. If the shipper fails to follow the instructions—shipping by a more expensive route—he is promptly charged back with the difference. One girl handles the entire system, and during its first year of operation the store saved a total of approximately \$6000.

The present precarious position of motor freight forwarders received  
(TURN TO PAGE 78, PLEASE)

"Stromberg has certainly taken the mystery out of Carburetor Service and Carburetor Sales!"

*Right!*



We've made the job easy to do  
... and still easier to *sell!*

THE Stromberg Profit Plan may not be a great discovery in carburetor merchandising, but it's opened the eyes of a whole lot of automotive service specialists! It's a plan whereby any competent mechanic can quickly service a carburetor at a flat, clean-profit price, and be positive he's done a good job.

Is it any wonder service men are strong for the 1941 Stromberg Profit Plan?

It includes merchandise keyed to the times—backed by powerful merchandising helps—counter displays, folders, direct mail pieces, signs and magazine advertising. All these are repeating the sound, simple, believable Stromberg Story—"Better Carburetion Buys More Miles Per Dollar." Get the full facts from your Bendix factory man or write—

BENDIX PRODUCTS DIVISION  
OF BENDIX AVIATION CORPORATION  
SOUTH BEND, INDIANA

**STROMBERG**  
**CARBURETOR**  
A BENDIX PRODUCT

COMMERCIAL CAR JOURNAL  
FEBRUARY, 1941

When writing to advertisers please mention Commercial Car Journal

*Carries a 100% Satisfaction guarantee of 7 Miles!*

*Better CARBURETION BUYS MORE MILES PER DOLLAR*

A LIBERAL TRADE IN ALLOWANCE FOR YOUR OLD CARBURETOR

**BETTER CARBURETION buys more MILES-PER-DOLLAR**

THE STROMBERG STORY IS SOMETHING EVERY OWNER CAN UNDERSTAND!

## FWD ANNOUNCES RE-STYLED "H" SERIES



New "H" series FWD chassis. Note skirting in front which gives added protection

THE FWD line has been restyled to combine attractiveness with practicability. Mechanical improvements that increase the performance of the truck, reduce the weight and provide greater accessibility are features of the 1941 line. The newly designed models of the lighter "H" series are already available and refinements in some 15 other models will soon be announced.

The attractive new styling features horizontal radiator louvres with a radiator shell separate from the core,

a frame that is tapered only on the under side on the front and rear and refinements in the engine and transfer case. Cab appointments, including an adjustable seat, provide greater driver comfort. The newly-designed skirting in front of the fenders protects the radiator grill and fenders, and acts as a bumper.

Of special interest is the provision made for use of optional engines, which, in the "H" series, allows for engines from 85 h.p. to 113 h.p. Two series of axles are also available in

these trucks, to take gross loads up to 20,000 lb. The transfer case is arranged so that a power take-off can be installed to use all the speeds of the transmission and the full torque of the motor for earth-boring machines and other attachments.

The new fender arrangement accommodates all types of snow plows and front-end equipment without alterations to the skirting and fenders. Another feature allows for either a high or low mounting of the engine, transmission, and transfer case, depending upon the height of the body mount. Where center scraper plow and under-body graders are used, a 23-inch clearance under the center of the truck is provided.

Included in the developments are a new FWD manufactured axle for the "H" series and a power proportioning differential for four and six-wheel drive trucks which divides the power in the center of the truck to each axle in proportion to its normal loaded weight. Of special interest to heavy-duty truck operators is the new 10-speed transmission, also of FWD manufacture.

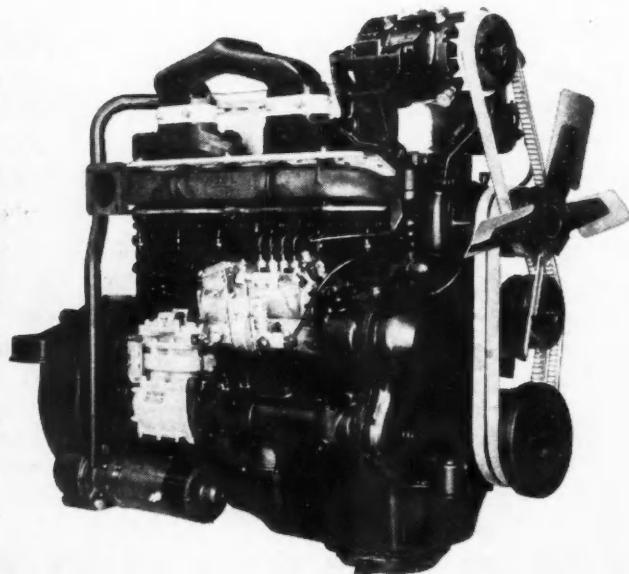
All models are furnished in both conventional and cab-over-engine design, provision being made for from two to seven passengers in the driver's compartment.

## MACK OFFERS NEW 405-CU. IN. DIESEL

A NEW Mack-Lanova diesel engine, model END-405 has just been added to the line of Mack Trucks Inc. It is a smaller edition of the previously announced Mack-Lanova ED and END-605 models and is designed for trucks in the 24,000 to 26,000 lb. gross vehicle weight range.

Having a piston displacement of 405 cu. in. and bore and stroke of 4 in. x 5 3/8 in., the new engine operates at the maximum governed speed of 2200 r.p.m. and develops 107 h.p. at that speed. Maximum torque at 1200 r.p.m. is 308 lb. ft. Like all Mack diesels it employs the Lanova system of controlled combustion for which high power and economy with moderate compression and fuel injection pressure, are claimed.

Injection side of the new Mack-Lanova diesel model END-405



Cylinders and crankcase are cast in block with removable dry cylinder sleeves. The two detachable cylinder heads are held down by thirty-two

studs. Overhead valves are operated by pushrods and rockerarms and double concentric valve springs. In-  
(TURN TO PAGE 82, PLEASE)

# Exides . . . .

## help Rochester Packing Company's fleet to stay on the job day after day



• One of six Exide-equipped Mack units recently added to the fleet of the Rochester Packing Company, Rochester, N.Y.

**S**UMMER AND WINTER, regardless of temperature and road conditions, the Rochester Packing Company's fleet of sixty-two trucks and passenger cars is on the job distributing Arpeako products throughout western New York State. In a service demanding dependability of a high order, this operator knows that good equipment properly maintained will give the desired results. The proper type of Exide Battery, plus Exide Engineering Service, insures the utmost in battery dependability.

This has been the experience of fleet operators in all parts of the country. Some operate in southern states where summer heat is intense. Others meet the worst of winter weather. Some are on short hauls, some on long. Others are in transcontinental service. They

uniformly find in Exides the faithful, trouble-free, long-life service that keeps down battery costs.

25% longer life is built into the Exides of today. These batteries are also available with wood and fiberglass separators for "cycling" service. See your Exide Distributor, or write us for details.



**Exide**  
HEAVY-DUTY  
TRUCK BATTERIES

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia  
*The World's Largest Manufacturers of Storage Batteries for Every Purpose*  
Exide Batteries of Canada, Limited, Toronto

## THREE-AXLE SEMI-TRAILER



To increase the payload of one of its dual-axle semi-trailers from 16 tons to 19 tons, the R. G. Knoll Trucking Co., Los Angeles, has mounted a third axle just ahead of the other two. Results of the experimental job shown in the accompanying photograph have been so satisfactory that the company is making the same installation on several other pieces of its equipment. All the work is done in the company's own shop.

The distance between the axles is sufficient to give 3 to 4 in. clearance space between the treads of the tires. The axles on the trailer are just over 46 in. apart. Tires are 42 x 10.

No mechanical arrangement was used or made on this installation to prevent scuffing of the tires on the two rear axles. This operator generally gets 100,000 miles on a set of trailer tires. The three-wheeled job has put something over 30,000 miles on its tires since it started rolling "that way." New tires went on all around but since no apparent wear whatsoever can be seen thus far it would appear that under the hauling conditions encountered, namely, regular highway city-to-city work, there is no need to provide against tire scuffing.

The pay load of this job is 38,000

lb. or 19 tons, of which the triple-wheel assembly carries 30 per cent more than the front end, which rests on the fifth-wheel of the tractor. The share of the load carried by the three axles is equally divided among them.

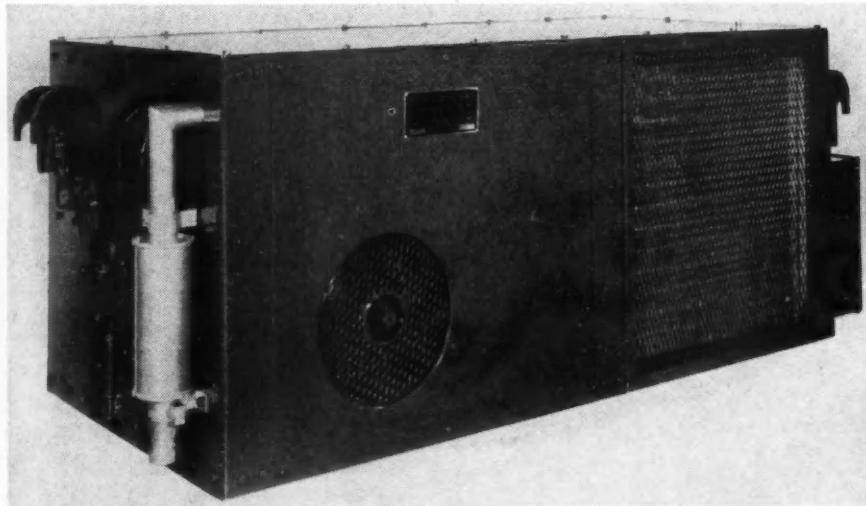
Conventional tubular type trailer axle, springs, spring hangers, rocker arms, and brake assemblies such as are found on practically any dual axle semi-trailer, were used for this installation. An extra spring rocker arm was required for each side when the new axle was installed as a rocker arm is necessary between each pair of wheels to obtain the proper spring action.

The four additional tires under this 35-ft. van greatly increase the braking power of the entire vehicle, more than offsetting the additional weight of the axle assembly plus the extra pay load. Also the lessening of weight carried per tire is expected to result in increased tire mileage.

Considerably better distribution of weight has been gained from the alteration, and this, together with the added braking power, improves the safety factor of the entire vehicle.

The weight of the new axle assembly was about 1800 lb. and the cost, ready for the road, was about \$900.

## NEW BAKER REFRIGERATING UNIT



A NEW and greatly improved truck refrigerating system has recently been announced by the Baker Ice Machine Co., Omaha, Neb. The new unit is said to pro-

vide increased capacity at no increase in price, while greater efficiency has reduced operating cost.

Six different models are available in stock sizes to meet the needs of

virtually any size or temperature requirement. Each is self-powered with a gasoline engine and each is fitted with completely automatic temperature controls. Power units may be mounted either inside the body, or in self-contained units beneath the truck or trailer body.

An example of the latter type is shown at left. Note brackets for mounting on channel irons, air intakes for condenser and engine cooling, and the outside-mounted muffler for auxiliary engine.

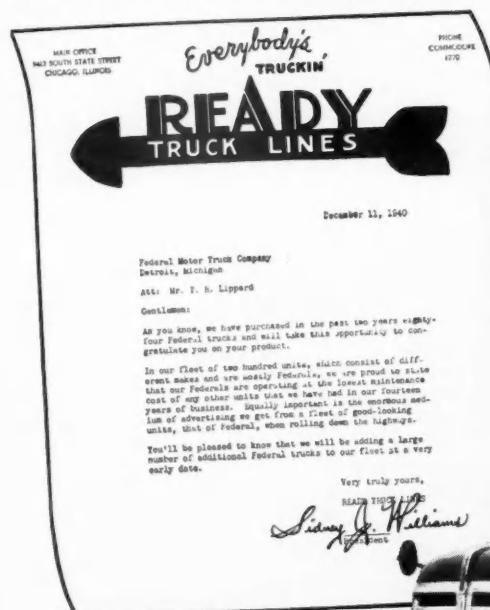
With the Baker unit, any temperature from 15 deg. below zero to 40 deg. above zero may be maintained for any length of time, and regardless of outside temperatures. This feature enables the operator to haul any type of perishable product by simply selecting the proper temperature instead of being restricted to products suited to a fixed temperature.



# "84 FEDERAL TRUCKS -IN THE PAST TWO YEARS

**- - - operating at the lowest maintenance cost of any other units we have had in our fourteen years of business - - -" Writes-**

SIDNEY J. WILLIAMS, President of READY TRUCK LINES, Inc., Chicago



**YOU CAN  
TOSS THE  
TOUGH JOBS  
TO  
FEDERAL-**

**FEDERAL TRUCKS**

For 31 Years—Known in Every Country—Sold on Every Continent  
**FEDERAL MOTOR TRUCK CO., DETROIT, MICHIGAN**

**"TON FOR TON IN '41—FEDERAL LEADS THE WAY!"**

# SHOWCASE OF NEW PRODUCTS



## Van Norman Has New Wet Valve Refacer and New Surface Grinder

Van Norman has added a new wet-grinding version of its well-known dry-grinding Model Y Valve Refacer which takes valves up to 11/16 in. The new model has a 1/3-hp. motor, 5-in. wheel, and the Van Norman "Rap-i-Matic" table traverse. New features include a built-in grinding attachment, and an entirely new method of refinishing the butt ends of Ford valves.

Van Norman's No. 555 Multi-purpose Horizontal Surface Grinder has undergone several changes. The new machine has a 2-hp. motor driving an 11-ft. cupped wheel on a spindle mounted on precision ball and roller bearings. It is also equipped with a vacuum attachment. This grinder handles cylinder heads of all passenger cars and trucks as well as manifolds and tops of motor blocks which have become warped through use. It grinds from .001 to .002 in. of metal per minute which means an average head can be accurately resurfaced in about 3 minutes.

Full details of both machine can be had by writing Van Norman Machine Tool Co., Springfield, Mass.

## Grey-Rock Announces New Line

A new line of brake lining equipment known as Grey-Rock "Standard Sets" is being offered by the United States Asbestos Division of Raybestos-Manhattan, Inc., Manheim, Pa. These sets are available with full coverage on all Ford, Chevrolet

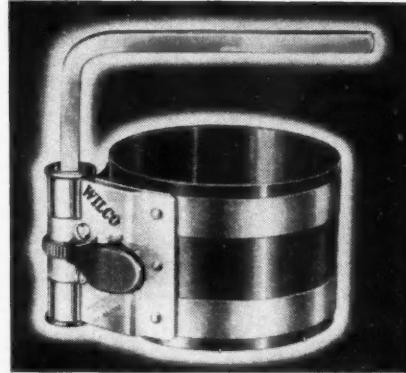


and Plymouth models, as well as Bendix, Lockheed and others. The higher-priced Grey-Rock Balanced Brakeset line has been expanded to include several additional drilled and countersunk sets and also several multi-coverage drilled sets for Bendix shoes.

The Grey-Rock organization also has announced a brake shoe exchange service whereby its jobbers will offer completely reconditioned shoes on all popular models.

## Piston Ring Compressor

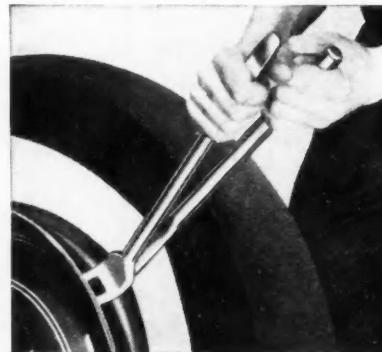
A new piston ring compressor known as the Wilco Master-Universal has been announced by the Wilkening Mfg. Co., Phila., Pa. A ratchet lock eliminates slippage of the compressor bands while the piston and ring are being pushed into the cylinder.



Two tension bands keep all the rings under full compression until they are in the cylinder. Model MU-5 is available in diameters from 2 1/8 in. to 5 in. Model MU-7, in diameters from 3 1/2 in. to 7 in.

## Kennedy Tire Remover

Designed to handle tires of any size, a new tire tool has been developed by the Kennedy Service Tools Co., Mogadore, Ohio. A simple leverage principle is em-



ployed to remove tires without hammering on tire or rim. The new tool is said to operate equally well on the Chrysler Safety Rim.

## Gar Wood Announces '41 Line

The most complete line of road machinery in the company's history is being offered for 1941 by the Road Machinery division of Gar Wood Industries, Inc., Detroit, Mich. Included are scrapers, both hydraulically and cable controlled, rippers and rollers, Bulldozers and Roadbuilders. Gar Wood engineers have recently perfected a new type, double-drum, cable-control, power unit.

## Delivery Tire Heads Line

A new Fisk "Delivery" tire, built of rayon for heavy-duty truck service is featured among the 12 new tires for 1941 manufactured by the Fisk Tire Division, United States Rubber Co., New York City, N. Y. A more flexible body with a 10 per cent deeper tread is said to give the new tire extra strength and longer life. The tread is claimed to wear two to three times as long as conventional treads.



## Rope Securer

A one-piece device for fastening tarpaulin ropes without knots is being offered by the Cleveland Accessories Co., 1515 N. B. C. Bldg., Cleveland, Ohio. Known as Rop-Loc, it consists of a specially formed hook of high-tensile steel, cadmium plated, and provided with holes for screw insertion. Attachment may be made, however, by welding or riveting to any type of body. A locking hitch which cannot slip is quickly formed by looping a turn around the hook and drawing the rope end tight in the gripper. Available in two sizes, one for tarpaulin ropes and the other for heavier service, such as tying down loads.

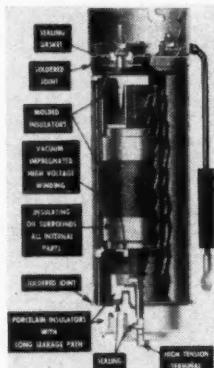
## Dump Body by Hercules

A new dump body style involving special bracing construction has been announced by the Hercules Steel Products Co., Galion, Ohio. The unit incorporates over 6 ft. of continuous side bracing on an 8 ft. body, with 30 in. spacing between braces. This method is said to prevent spread and sag caused by breaking down of the top edge of the body. Known as the "girder-trussed panel body," it is available in all lengths, widths and capacities.

## High-Compression Coil

A new type, oil-filled, high-compression coil for passenger cars and light trucks has been announced by the Delco-Remy Div., General Motors Corp., Anderson, Ind. Features of the new coil are hermetic sealing, high-dielectric porcelain insulators and higher voltage windings. It is standard equipment on 1941 Chevrolets and is merchandised through United Motors Service.

(TURN TO PAGE 58, PLEASE)





## "A.W." QUALITY PRODUCTS

From Mine to Consumer . . . Carbon, Copper or Alloy Steels—in any open hearth analysis to meet your specifications. Welding qualities, toughness, abrasion resistance, ductility . . . Ingots, Billets, Blooms, Slabs, Sheared Steel Plates, Hot Rolled Sheets. Floor Plates for every flooring need. Steel Cut Nails in all types and sizes. "Swede" Pig Iron—Foundry, Malleable, Basic, Bessemer. "A.W." Products have been an accepted standard for steel buyers for more than a century.

**ALAN WOOD STEEL COMPANY, CONSHOHOCKEN, PA.**

SINCE 1826 : : DISTRICT OFFICES AND REPRESENTATIVES—Philadelphia, New York, Boston, Atlanta, Buffalo, Chicago, Cincinnati, Cleveland, Denver, Detroit, Houston, New Orleans, St. Paul, Pittsburgh, Roanoke, Sanford, N.C., St. Louis, Los Angeles, San Francisco, Seattle, Montreal.

# NEWSCAST



## Preliminary Figures Put Total Truck Registrations at 4,650,000

A total of 4,650,000 trucks was registered in the United States during the calendar year 1940 according to preliminary statistics of the industry released last month by the Automobile Manufacturers Association. This compares with 27,300,000 passenger cars.

Truck sales from U. S. factories during the year totaled 771,000 units having a wholesale value of \$598,300,000. Special motor truck taxes reached a high of \$460,000,000, while taxes on gross revenue of for-hire trucks amounted to 6.8 cents on every dollar.

## ATA Enters New Defense Activities

Four new defense activities on the part of the American Trucking Associations, Inc., have been authorized by the organization's executive committee. They are:

1. Preparation of a standard identification form for truck drivers and other employes entering manufacturing plants, refineries and other industrial premises producing defense goods.

2. Formation of a nationwide committee, with a member in each state, to raise funds to purchase "rolling kitchens" for Great Britain.

3. Preparation of a plan to estimate the industry's equipment needs in 1941, in anticipation of Government demands that trucks give preference to transportation of defense materials.

4. Further representations to the State Department in an effort to arrive at a reciprocal arrangement with Canada whereby domestic motor carriers would be permitted to transport goods, in bond, from one point in the U. S. to another point in the U. S., through Canada, and to interior points in Canada.

**The eighth annual convention of the ATA will be held in New York some time between Oct. 15 and Nov. 15.**

## Auto Show Called Off

There will be no National Automobile Show in New York next fall. That is the word just released by the Automobile Manufacturers Association with National Defense activities, of course, posted as the reason.

## Log Requirements Modified

Drivers of private trucks who cross state lines only at infrequent intervals need fulfill the driver's log requirements of Motor Carrier Safety Regulations only on the days in which the truck is operated in interstate commerce. Such was the informal decision recently handed to the National Council of Private Truck Owners, Inc., by H. Y.

Blanning, director of the ICC's Bureau of Motor Carriers.

Commissioner Blanning called attention to the fact, however, that drivers who alternate regularly between interstate and intrastate routes must keep a log at all times.

## Rodgers Named to Quartermaster's Advisory Transportation Committee

Ted V. Rodgers, president of American Trucking Associations, Inc., has been selected by Major General Edmund B. Gregory, the Quartermaster General, to represent trucking interests on a new advisory committee on army transportation problems.

Chief aims of the committee are to increase the efficiency of present transportation means, to make the most effective use of each form available, to employ most efficient methods in reducing static inventories of military stocks with particular emphasis on reduction of delivery time, and to study difficulties which can be anticipated and avoided in an emergency.

## 10 States Agree on Sizes & Weights

Representatives of 10 northeastern states, meeting recently in New York, agreed upon uniform state size and weight standards, opposed Federal regulations and filed their recommendations with the ICC. Reported specifications are: 96 in. width; 12½ ft. height; 35 ft. length for single vehicles and 50 ft. for combinations; 30,000 lb. weight on two axles, 40,000 lb. on three axles and 18,000 lb. on any one axle; wheel loads should not exceed 9000 lb. or 300 lb. per in. of tire width.

## Fuel & Lubricants Discussion

A special meeting on gasoline engine fuel and lubricants is scheduled by the American Transit Association for Feb. 17 and 18 at the Book-Cadillac Hotel, Detroit. Floyd L. Wheaton of the Detroit Railway Co. will be chairman of the meeting with Errol J. Gay of Ethyl Gasoline Corp. as co-chairman.

## Guy Morgan Dies

Guy Morgan, an executive of the Wards Corp. and an old-timer in the truck industry, died recently.

## Commercial Motor Carriers Move First Army Regiment

The Army's first move of a complete fighting unit, the 153rd Infantry Regiment of the Arkansas National Guard, entirely by means of commercial motor carriers, was completed, reportedly without a hitch early last month in Arkansas.

About 1900 officers and men together with approximately 146 tons of baggage and military equipment were transported from 15 different pick-up points in the

state to Camp Joseph T. Robinson. Fifty-six buses and 21 trucks were used to complete the job on schedule. The American Trucking Associations, Inc., and the Public Roads Administration were on hand to check conditions.

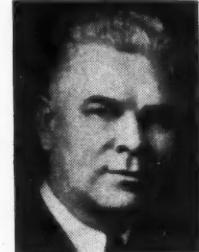
## "Army on Wheels"

While on the subject of military matters, "Army on Wheels," a new motion picture of U. S. Army mechanized forces in action produced by Dodge Brothers Corp. in cooperation with the War Department, is reported well worth the time it takes to see it.

## Getting Personal

Several changes have been announced in the Dodge field organization. W. H. Lacy is a special representative in the Atlanta region. Frank V. Smith, formerly of White Plains (N. Y.), is now district representative in Hempstead, N. Y. John Yoke has the same job at Poughkeepsie, N. Y., and C. H. Kenney at Rochester. J. F. Brown becomes district truck manager in the Cedar Rapids, Iowa, and Madison, Wis., districts, and R. C. Ripley is truck manager at Cincinnati.

**Robert E. McGill, recently appointed sales manager of Aluminum Industries, Inc., has been West Coast manager since 1927**



Victor S. Barnes has been named to the newly created office of general sales manager of Haskelite Mfg. Corp.

**G. H. Ford, for many years chief timer at Indianapolis Speedway, has joined Marmon - Herrington Co. as head of new Test and Proving Division**



Paul B. Hoffman is the new general sales manager of American Brakebloc Division of American Brake Shoe and Foundry Co. Brooke, Smith, French & Dorrance of Detroit and New York will handle the company's advertising.

**Frank J. Santry, well-known in automotive circles since 1903, is the new Central Division Manager for The Trailer Co. of America**



(TURN TO PAGE 46, PLEASE)



## New York Diesel Fleet Reduces Oil Consumption 30% with Lubri-Zol *Also ends ring-sticking and sludge troubles*

• That's what a switch to Lubri-D-Zel Lubricating Oil did for Russo Trucking Company of New York.

Russo operates six diesel-powered units averaging 300 miles daily with 35,000 pounds pay load. Using widely known straight lubricating oils,

Russo experienced ring and sludge troubles despite a careful preventive maintenance schedule. Sticking rings caused loss of power and high oil consumption. Heavy sludge required frequent change of filter bags.

Finally Russo changed to Lubri-D-Zel Diesel Lubricating Oil. As the gum solvents in Lubri-D-Zel acted on ring deposits power output went up and oil consumption went down—as much as 30%. Engines are cleaner and filters last longer.

Russo's experience is typical of that of hundreds of fleets—both diesel and gasoline powered. Let the Lubri-Zol Fleet specialist near you help you make these important savings in your operation. Write today to the Lubri-Zol Corporation, Cleveland, Ohio.

• Lubri-Zol Fleet Lubricants—oils, gear lubricants, greases—are all processed to have higher film strength and oiliness, greater stability, resistance to gum, varnish and sludge. Use of Lubri-Zol Lubricants assures you lowered operating and maintenance costs—more miles per dollar. Let us prove it to you.

*Buy your oil on  
the cost per mile...  
and save.. with*

Fully Protected by U. S. and Foreign Patents

**LUBRI**  
REG. U.S. PAT. OFF.  
**ZOL**

## NEWSCAST (Cont'd from Page 44)

George L. Briggs, former executive vice-president of Wilkening Mfg. Co., Philadelphia, has joined the Chicago advertising agency of Behel and Waldie.

D. H. McAdams, regional manager for automotive products of the Joyce-Cridland Co., Dayton, Ohio, has moved his Chicago office to 122 So. Michigan Ave.

The name of Earl G. Gunn, who recently became associated with the Manley Mfg. Division of American Chain & Cable Co., Inc., York, Pa., as consulting engineer, was incorrectly stated in the January issue. His correct name is shown above.



**David A. Cowhig** is the new general manager of Wilkening Mfg. Co. (Pedrick Rings). He takes over the duties of George L. Briggs, resigned

## Business Briefs

An initial order for 27 drop-frame van-type semi-trailers is being filled by the Fruehauf Trailer Co. for the Aeronautics Division of the U. S. Navy. Meanwhile

Fruehauf is working on its \$1,200,000 order from the War Department Engineers Corp. for 751 semi-trailer pontoon carriers.

A. C. Harvey Co., Allston, Mass., has been appointed to handle the line of Hobart "Multi-Range" Arc Welders, collaborating with Leo Gordon of Hobart Brothers' New England office.

Keeping pace with progress in engine bearing development, the Federal-Mogul Corp. recently opened a new engine dynamometer laboratory as a part of its engineering research division. The facilities include two hydraulic brake dynamometers and a chassis dynamometer.

Bear Mfg. Co., Rock Island, Ill., has announced an expansion program that will double and possibly triple present production capacity. First part of the program will be a new two-story addition to the company's main building where offices and new manufacturing space will be provided.

**Gerald N. Knowles**, recently appointed to the Brunner Mfg. Co. sales staff, has a thorough background of refrigeration experience



Early in 1941 the McCullough Engineering Co., Milwaukee, Wis., will move to a new and larger plant, now under construction. At the present time the company is a principal supplier of superchargers for leading commercial diesel engine builders and, in addition, is making Roots type cabin superchargers for pressurizing military plane cabins.

Kingham Trailer Co., Louisville, Ky., has named the newly organized Bedell Trailer Sales Co. of San Antonio, Tex., as its distributor for Southwest Texas. Wade R. Bedell, who heads the new company, has been active in trailer sales work in Texas for many years.

## Maine Truck Owners Association

The Maine Truck Owners Association was formed at Augusta, Jan. 18, when 200 truck owners from all parts of the state met at the Collins House. Officers of the new association are: George W. Snow, president; Walter R. Lipe, vice-president; Everett O. Merrill, treasurer, and Edward H. Cushman, secretary.

**HANSEN-MODERN** as the Most Modern Body

CONSTANTLY modernized to meet the many and varied changes in body designs—ruggedly and durably built to give steady, lasting service—simple in design and easy to apply—Hansen Hardware maintains its established leadership.

Each year Hansen adds new products—new and improved designs—making the Hansen line more complete than ever—from which your principal body hardware needs can be supplied.

**Suggested Hansen Hardware for Modern Body Shown**

No. 10 Leaf-Type Hinge. Standard 12" lengths make hinges of any length.  
No. 12 Leaf-Type Hinge. 12" long. Other lengths available. Strong. Unbreakable!  
No. 60 Extension Lock. One piece. No loose parts. Wide striker bolt.  
No. 70-DL Lock with Locking Device. Compact. Convenient. Tamper proof.  
No. 71 Offset Handle. All steel. Easy to grip. Rugged. Durable.  
No. 85 Window Regulator. Straight-up lift. Enclosed mechanism. Rust proof.

Ask for Catalog  
**A. L. HANSEN MFG. CO.**  
5047 Ravenswood Ave.  
CHICAGO, ILL.



Completely concealed inside this 90-ton culvert destined for the Redding Dam is the Trailmobile trailer which took the load in stride even though the bridge had to be reenforced.

# KEY TO DEFINITIONS, ABBREVIATIONS AND REFERENCES

## DEFINITIONS

**MADE AND MODEL** Only Domestic Truck Models are listed.

For the express purpose of best fitting the term "Domestic" to the most of the models listed can be applied to optional engines, transmissions, axles, etc., and these models when so equipped are considered standard stock models.

### CHASSIS LIST PRICE

The chassis list price applies to the plain-line models available in standard tires and standard equipment. All prices are F.O.B. factory. All prices listed in the chassis list price do not include the price of the Cab unless otherwise noted.

**RECOMMENDED GROSS VEHICLE WEIGHT FOR NORMAL SERVICE**

The Gross Weights published herewith are those supplied by manufacturers as their Recommended Gross Vehicle Weights for Normal Operation. Conditions and standards of operation are F.O.B. factory. All prices listed in the chassis list price do not include the price of the Cab unless otherwise noted.

**CHASSIS WEIGHT** The chassis weight listed includes the weight of the minimum standard wheelbase chassis, base cow, wheel, standard tire, chassis, steel fenders, front fender, front fender and coupling rod, front full tank, 5 gallons of fuel in the tank. It does not include the weight of the Cab. This applies to C.O.E. as well as conventional chassis types. Exceptions are noted.

### MAXIMUM AUTHORIZED

The tire size listed in this column is the maximum recommended for the Gross Vehicle Weight for Normal Operation. It is furnished at extra cost. If it differs from the standard size, dual rearers are understood; exceptions noted.

### MINIMUM STANDARD WHEELBASE

The minimum standard wheelbase is the go-allied standard wheelbase on which the Chassis List Price is based.

### WHEELSTAKE

The maximum standard wheelbase is the extreme end of the standard range of wheelbases offered by the chassis maker. Maximum Brake Horsepower at Given R.P.M. is actual dynamometer reading without accessories.

### GEAR RATIO RANGE

Gear Ratio Range in High—Ratio within the range given are available at no extra cost. Exceptions are noted.

### TRACTORS

Unless given the designation (N)—all standard models may be assumed to be available as tractors. Exclusively Tractor models are designated (T).

## KEY TO REFERENCES

**c.f.**—Cab Forward design.  
**c.o.e.**—Cab-over-Engine design.

(C)—Converted Ford or Chevrolet model, identifiable by engine make listed.  
(D)—For dump or tractor service only.  
(E)—Diesel-engine equipped.

**e.b.s.**—Engine-between-seat design.

**e.u.s.**—Engine-under-seat design.  
(N)—Not available as a tractor.

(O)—Designed for truck use only.  
(3) Available—All models available in c.o.e. design, oversize power plants, oil engines and six-wheel construction.

(4) Chevrolet—Governor set not to exceed 45 M.P.H.  
Det—Detroit Gear.

(5) Condor—These models available with double drop bus frames.

(6) Federal—263 cu. in. engine and 11' clutch available on Models 15 and 15-1/2' 414 cu. in. and 428 cu. in. engines available on Model 40 and 15-1/2' 428 cu. in. engine available on Models 50, 60 and 70.

(7) GMC—263 cu. in. engine and 11' clutch available in 50 cu. in. 50-1/2 cu. in. 51 cu. in. 52 cu. in. 53 cu. in. 54 cu. in. 55 cu. in. 56 cu. in. 57 cu. in. 58 cu. in. 59 cu. in. 60 cu. in. 61 cu. in. 62 cu. in. 63 cu. in. 64 cu. in. 65 cu. in. 66 cu. in. 67 cu. in. 68 cu. in. 69 cu. in. 70 cu. in. 71 cu. in. 72 cu. in. 73 cu. in. 74 cu. in. 75 cu. in. 76 cu. in. 77 cu. in. 78 cu. in. 79 cu. in. 80 cu. in. 81 cu. in. 82 cu. in. 83 cu. in. 84 cu. in. 85 cu. in. 86 cu. in. 87 cu. in. 88 cu. in. 89 cu. in. 90 cu. in. 91 cu. in. 92 cu. in. 93 cu. in. 94 cu. in. 95 cu. in. 96 cu. in. 97 cu. in. 98 cu. in. 99 cu. in. 100 cu. in. 101 cu. in. 102 cu. in. 103 cu. in. 104 cu. in. 105 cu. in. 106 cu. in. 107 cu. in. 108 cu. in. 109 cu. in. 110 cu. in. 111 cu. in. 112 cu. in. 113 cu. in. 114 cu. in. 115 cu. in. 116 cu. in. 117 cu. in. 118 cu. in. 119 cu. in. 120 cu. in. 121 cu. in. 122 cu. in. 123 cu. in. 124 cu. in. 125 cu. in. 126 cu. in. 127 cu. in. 128 cu. in. 129 cu. in. 130 cu. in. 131 cu. 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Line Number	Make Model	Chassis List Price	Wheel- base	TIRE SIZES			ENGINE DETAILS			TRANSMISSION			REAR AXLE			FRONT AXLE			BRAKES			FRAME				
				Dual rear S-single rear		Front tire size less weight (See chassis weight)	Model and series	Stroke in. or cc.	Displacement cu. in. or cc.	Comp. Ratio	Torque lb.-ft. Max. Brake P.M.	Driven P.M.	Main Bearings	Front diameter, in.	Rear diameter, in.	Model and series	Model and series	Driveline and Type	Model and series	Brake operator	Model and series	Hand brake location	Type	Side Rail Dimensions	Mid. SCD. W. Lbs.	C-A Dimensions
				Dual rear S-single rear		Front tire size less weight (See chassis weight)	Model and series	Stroke in. or cc.	Displacement cu. in. or cc.	Comp. Ratio	Torque lb.-ft. Max. Brake P.M.	Driven P.M.	Main Bearings	Front diameter, in.	Rear diameter, in.	Model and series	Model and series	Driveline and Type	Model and series	Brake operator	Model and series	Hand brake location	Type	Side Rail Dimensions	Mid. SCD. W. Lbs.	C-A Dimensions
1	Aval- (3)	C-100	11500	4000	6.50/20D	7.50/20	Wau-BL	Con 218	245.5	7.165	73-3000	7.25-1014	165	71.300	78.3100	N WG T9	H	**-6.6	SP 10	104 P	114	8-24x10	...	...		
2	Aval- (3)	C-250	15000	4300	6.50/20D	7.50/20	Wau-BL	Con 253	245.5	7.165	73-3000	7.25-1014	165	71.300	78.3100	N WG T9	H	**-6.6	SP 10	104 P	114	8-24x10	...	...		
3	Aval- (3)	C-350	17900	4800	7.50/20D	8.25/20	Wau-BM	Con 202	282.5	7.178	85-3200	7.25-1014	170	82.300	88.3200	N WG T9A	H	**-6.8	SP 10	104 P	114	8-24x10	...	...		
4	Aval- (3)	C-400	19000	4800	7.50/20D	8.25/20	Wau-BM	Con 202	282.5	7.188	85-3200	7.25-1014	170	82.300	88.3200	N WG T9A	H	**-6.8	SP 10	104 P	114	8-24x10	...	...		
5	Aval- (3)	C-450	20500	5550	8.25/20D	9.00/20	Wau-BZ	Con 250	282.5	7.188	85-3200	7.25-1014	170	82.300	88.3200	N WG T9A	H	**-7.4	SP 10	104 P	114	8-24x10	...	...		
6	Aval- (3)	C-500	22000	6100	9.00/20D	10.00/20	Wau-MKR	Con 250	320.5	7.200	99-2400	7.25-1014	170	99.300	106.2500	N WG T9A	H	**-7.8	SP 10	104 P	114	8-24x10	...	...		
7	Aval- (3)	C-550	28500	8000	10.00/20D	11.00/20	Wau-MKR	Con 250	381.5	7.220	104-2400	7.25-1014	170	104.300	111.2500	N WG T9A	H	**-8.1	SP 10	104 P	114	8-24x10	...	...		
8	Aval- (3)	C-600	32200	8000	10.00/20D	11.00/20	Wau-SRLR	Con 250	402.5	7.225	104-2400	7.25-1014	170	104.300	111.2500	N WG T9A	H	**-8.4	SP 10	104 P	114	8-24x10	...	...		
9	Aval- (3)	C-650	38000	8000	10.00/20D	11.00/20	Wau-SRLR	Con 250	423.5	7.230	104-2400	7.25-1014	170	104.300	111.2500	N WG T9A	H	**-8.7	SP 10	104 P	114	8-24x10	...	...		
10	Aval- (3)	C-700	41750	Opt	35000	8700	10.00/20D	12.00/20	Wau-SRK	Own	4-2263.5	50-7.14	341	22-3800	3-2411.005	N WG T8E	S	H	**-5.25	SP 10	104 P	114	8-24x10	...	...	
11	Bantam	...	349	75	75	1700	5.00/15	Own	218	71.300	73-3000	7.25-1014	165	71.300	78.3100	N WG T9	H	**-6.6	SP 10	104 P	114	8-24x10	...	...		
12	Bantam	...	349	75	75	1700	5.00/15	Own	218	71.300	73-3000	7.25-1014	165	71.300	78.3100	N WG T9	H	**-6.6	SP 10	104 P	114	8-24x10	...	...		
13	Bantam	...	349	75	75	1700	5.00/15	Own	218	71.300	73-3000	7.25-1014	165	71.300	78.3100	N WG T9	H	**-6.6	SP 10	104 P	114	8-24x10	...	...		
14	Brockway	...	595	138	164	18000	3.25/60	Con 218	245.5	7.165	73-3000	7.25-1014	165	71.300	78.3100	N WG T9	H	**-6.6	SP 10	104 P	114	8-24x10	...	...		
15	Brockway	...	595	138	164	18000	3.25/60	Con 218	245.5	7.165	73-3000	7.25-1014	165	71.300	78.3100	N WG T9	H	**-6.6	SP 10	104 P	114	8-24x10	...	...		
16	Brockway	...	595	138	164	18000	3.25/60	Con 218	245.5	7.165	73-3000	7.25-1014	165	71.300	78.3100	N WG T9	H	**-6.6	SP 10	104 P	114	8-24x10	...	...		
17	Brockway	...	595	138	164	18000	3.25/60	Con 218	245.5	7.165	73-3000	7.25-1014	165	71.300	78.3100	N WG T9	H	**-6.6	SP 10	104 P	114	8-24x10	...	...		
18	Brockway	...	595	138	164	18000	3.25/60	Con 218	245.5	7.165	73-3000	7.25-1014	165	71.300	78.3100	N WG T9	H	**-6.6	SP 10	104 P	114	8-24x10	...	...		
19	Brockway	...	595	138	164	18000	3.25/60	Con 218	245.5	7.165	73-3000	7.25-1014	165	71.300	78.3100	N WG T9	H	**-6.6	SP 10	104 P	114	8-24x10	...	...		
20	Brockway	...	595	138	164	18000	3.25/60	Con 218	245.5	7.165	73-3000	7.25-1014	165	71.300	78.3100	N WG T9	H	**-6.6	SP 10	104 P	114	8-24x10	...	...		
21	Brockway	...	595	138	164	18000	3.25/60	Con 218	245.5	7.165	73-3000	7.25-1014	165	71.300	78.3100	N WG T9	H	**-6.6	SP 10	104 P	114	8-24x10	...	...		
22	Brockway	...	595	138	164	18000	3.25/60	Con 218	245.5	7.165	73-3000	7.25-1014	165	71.300	78.3100	N WG T9	H	**-6.6	SP 10	104 P	114	8-24x10	...	...		
23	Brockway	...	595	138	164	18000	3.25/60	Con 218	245.5	7.165	73-3000	7.25-1014	165	71.300	78.3100	N WG T9	H	**-6.6	SP 10	104 P	114	8-24x10	...	...		
24	Brockway	...	595	138	164	18000	3.25/60	Con 218	245.5	7.165	73-3000	7.25-1014	165	71.300	78.3100	N WG T9	H	**-6.6	SP 10	104 P	114	8-24x10	...	...		
25	Brockway	...	595	138	164	18000	3.25/60	Con 218	245.5	7.165	73-3000	7.25-1014	165	71.300	78.3100	N WG T9	H	**-6.6	SP 10	104 P	114	8-24x10	...	...		
26	Brockway	...	595	138	164	18000	3.25/60	Con 218	245.5	7.165	73-3000	7.25-1014	165	71.300	78.3100	N WG T9	H	**-6.6	SP 10	104 P	114	8-24x10	...	...		
27	Brockway	...	595	138	164	18000	3.25/60	Con 218	245.5	7.165	73-3000	7.25-1014	165	71.300	78.3100	N WG T9	H	**-6.6	SP 10	104 P	114	8-24x10	...	...		
28	Brockway	...	595	138	164	18000	3.25/60	Con 218	245.5	7.165	73-3000	7.25-1014	165	71.300	78.3100	N WG T9	H	**-6.6	SP 10	104 P	114	8-24x10	...	...		
29	Brockway	...	595	138	164	18000	3.25/60	Con 218	245.5	7.165	73-3000	7.25-1014	165	71.300	78.3100	N WG T9	H	**-6.6	SP 10	104 P	114	8-24x10	...	...		
30	Brockway	...	595	138	164	18000	3.25/60	Con 218	245.5	7.165	73-3000	7.25-1014	165	71.300	78.3100	N WG T9	H	**-6.6	SP 10	104 P	114	8-24x10	...	...		
31	Brockway	...	595	138	164	18000	3.25/60	Con 218	245.5	7.165	73-3000	7.25-1014	165	71.300	78.3100	N WG T9	H	**-6.6	SP 10	104 P	114	8-24x10	...	...		
32	Brockway	...	595	138	164	18000	3.25/60	Con 218	245.5	7.165	73-3000	7.25-1014	165	71.300	78.3100	N WG T9	H	**-6.6	SP 10	104 P	114	8-24x10	...	...		
33	Brockway	...	595	138	164	18000	3.25/60	Con 218	245.5	7.165	73-3000	7.25-1014	165	71.300	78.3100	N WG T9	H	**-6.6	SP 10	104 P	114	8-24x10	...	...		
34	Brockway	...	595	138	164	18000	3.25/60	Con 218	245.5	7.165	73-3000	7.25-1014	165	71.300	78.3100	N WG T9	H	**-6.6	SP 10	104 P	114	8-24x10	...	...		
35	Brockway	...	595	138	164	18000	3.25/60	Con 218	245.5	7.165	73-3000	7.25-1014	165	71.300	78.3100	N WG T9	H	**-6.6	SP 10	104 P	114	8-24x10	...	...		
36	Brockway	...	595	138	164	18000	3.25/60	Con 218	245.5	7.165	73-3000	7.25-1014	165	71.300	78.3100	N WG T9	H	**-6.6	SP 10	104 P	114	8-24x10	...	...		
37	Brockway	...	595	138	164	18000	3.25/60	Con 218	245.5	7.165	73-3000	7.25-1014	165	71.300	78.3100	N WG T9	H	**-6.6	SP 10	104 P	114	8-24x10	...	...		
38	Brockway	...	595	138	164	18000	3.25/60	Con 218	245.5	7.165	73-3000	7.25-1014	165	71.300	78.3100	N WG T9	H	**-6.6	SP 10	104 P	114	8-24x10	...	...		
39	Brockway	...	595	138	164	18000	3.25/60	Con 218	245.5	7.165	73-3000	7.25-1014	165	71.300	78.3100	N WG T9	H	**-6.6	SP 10	104 P	114	8-24x10	...	...		
4																										

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Line Number	MAKE AND MODEL	WHEEL BASE		ENGINE DETAILS						TRANS-MISSION		REAR AXLE		FRONT AXLE		BRAKES		FRAME			
		Chassis List Price		Tire Sizes D-dual rear S-single rear	Front Suspension (less noted)	Rear Suspension (less noted)	Front Main Bearings	Front Diameter in. 2" number	Front Stroke in.	Front Cylinders and Bores, stroke in. dia. x stroke	Front Displacement cu. in.	Front Torque Ratio	Front H.p. at R.P.M.	Front Brake P.M.	Front Gears Per Revolution	Front Ratio	Front Brake Rate	Front Ratio in. to in.	Front Axle Dimensions (M-in., Scd. W., B.)	Side Rail Dimensions (M-in., Scd. W., B.)	Type
		Standard									Model and Forward Spds		Model and Reverse Spds								
1	Federal C. Cont.	\$35	2305	140	255	22500	6700	8.25/20	9.75/20	Her WXCC3	6-4-4	383.5	9.285	107-2800	7-2-13/14	Y Clia 205V	415	H. 16-7-40	Tim 32515H	LAIHV	
2		45	2950	140	255	24000	7300	9.00/20	10.50/24	Her WXLCC3	6-4-4	404.6	3.307	107-2800	7-2-13/14	Y Clia 270V	5	Tim 54411H	5758	LAIHV	
3		55	3550	140	255	24000	8000	9.00/20	10.50/24	Her WXLCC3	6-4-4	404.6	3.307	107-2800	7-2-13/14	Y Clia 270V	5	Tim 54411H	504	Sd. 844.8	
4		55H	4005	140	255	30000	7450	7.95/20	8.75/20	Her WXLCC3	6-4-4	404.6	3.307	107-2800	7-2-13/14	Y Clia 270V	5	Tim 54411H	57	T	
5		62	5675	140	211	35000	10400	10.50/20	11.25/24	Con 22RF	6-4-4	401.5	2.409	100-150	2400	Y Clia 270V	5	Tim 72743H	57	PD	
6		63	6075	141	211	35000	10200	10.50/20	11.25/24	Wau 63RKF	6-4-4	401.5	2.409	100-150	2400	Y Clia 270V	5	Tim 72746W	57	PD	
7		65	6455	141	211	40000	11300	10.50/24	11.25/24	Con 22RF	6-4-4	401.5	2.409	100-150	2400	Y Clia 270V	5	Tim 72746W	57	TD	
8		66	6455	141	211	40000	11300	10.50/24	11.25/24	Wau 63RKF	6-4-4	401.5	2.409	100-150	2400	Y Clia 270V	5	Tim 72746W	57	TD	
9		(c.o.e.) 77	765	104	215	40000	11300	10.50/20	11.25/24	Her JXXF	6-3-1	242.6	1.614	75-3000	7-2-10 1/2	N WG T9	4	Tim 55375H	57	T	
10		(c.o.e.) 77	816	104	215	42800	20175	10.50/20	11.25/24	Her JXXF	6-3-1	242.6	1.614	75-3000	7-2-10 1/2	N WG T9	4	Tim 55375H	57	T	
11		(c.o.e.) 80	1200	104	215	4900	12000	9.00/20	9.00/24	Her JXXF	6-3-1	243.1	1.782	82-3100	7-2-10 1/2	Y WG T9	4	Tim 55375H	57	T	
12	(c.o.e.) 80H	1200	104	215	4900	12000	9.00/20	9.00/24	Her JXXF	6-3-1	243.1	1.782	82-3100	7-2-10 1/2	Y WG T9	4	Tim 55375H	57	T		
13	(c.o.e.) 80H	1200	104	215	4900	12000	9.00/20	9.00/24	Her JXXF	6-3-1	243.1	1.782	82-3100	7-2-10 1/2	Y WG T9	4	Tim 55375H	57	T		
14	(c.o.e.) 80H	1200	104	215	4900	12000	9.00/20	9.00/24	Her JXXF	6-3-1	243.1	1.782	82-3100	7-2-10 1/2	Y WG T9	4	Tim 55375H	57	T		
15	(c.o.e.) 90	2540	104	215	4900	12000	9.00/20	9.00/24	Her WNLCC3	6-4-4	383.5	9.285	107-2800	7-2-13/14	Y Clia 205V	5	Tim 54411H	57	T		
16	(c.o.e.) 92	3095	116	216	2500	6000	9.00/20	9.00/24	Her WNLCC3	6-4-4	383.5	9.285	107-2800	7-2-13/14	Y Clia 205V	5	Tim 54411H	57	T		
17	(c.o.e.) 94	3645	116	173	24000	7900	9.00/20	9.00/24	Her WNLCC3	6-4-4	383.5	9.285	107-2800	7-2-13/14	Y Clia 205V	5	Tim 54411H	57	T		
18	(c.o.e.) 94H	4145	116	173	30000	9750	2040	10.50/24	Her WNLCC3	6-4-4	384.0	3.307	107-2800	7-2-13/14	Y Clia 270V	5	Tim 70796H	57	T		
19	For. Reg. 117-81	605	134	134	3138	6.00	20175	7.50/18-10	Own	8-3	32	221	1.50	85-3800	3-2	5x4.7	4	QWD OUT	504	TX	
20	Reg. 117-81	605	134	134	3138	6.00	20175	7.50/18-10	Own	8-3	32	221	1.50	85-3800	3-2	5x4.7	4	QWD OUT	504	TX	
21	Reg. 117-81	605	134	134	3138	6.00	20175	7.50/18-10	Own	8-3	32	221	1.50	85-3800	3-2	5x4.7	4	QWD OUT	504	TX	
22	Reg. 117-81	605	134	134	3138	6.00	20175	7.50/18-10	Own	8-3	32	221	1.50	85-3800	3-2	5x4.7	4	QWD OUT	504	TX	
23	(c.o.e.) 111W-8	840	101	101	31547	6.00	20175	7.50/18-10	Own	8-3	32	221	1.50	85-3800	3-2	5x4.7	4	QWD OUT	504	TX	
24	(c.o.e.) 111W-8	860	101	101	31547	6.00	20175	7.50/18-10	Own	8-3	32	221	1.50	85-3800	3-2	5x4.7	4	QWD OUT	504	TX	
25	(c.o.e.) 111W-8	860	101	101	31547	6.00	20175	7.50/18-10	Own	8-3	32	221	1.50	85-3800	3-2	5x4.7	4	QWD OUT	504	TX	
26	(c.o.e.) 111W-8	885	134	134	31547	6.00	20175	7.50/18-10	Own	8-3	32	221	1.50	85-3800	3-2	5x4.7	4	QWD OUT	504	TX	
27	(c.o.e.) 111W-8	885	134	134	31547	6.00	20175	7.50/18-10	Own	8-3	32	221	1.50	85-3800	3-2	5x4.7	4	QWD OUT	504	TX	
28	(c.o.e.) 111W-8	910	134	134	31547	6.00	20175	7.50/18-10	Own	8-3	32	221	1.50	85-3800	3-2	5x4.7	4	QWD OUT	504	TX	
29	1 Tonner N-33	5854	122	122	23429	6.00	20175	7.50/18-10	Own	8-3	32	221	1.50	85-3800	3-2	5x4.7	4	QWD OUT	504	TX	
30	1 Tonner N-33	5854	122	122	23429	6.00	20175	7.50/18-10	Own	8-3	32	221	1.50	85-3800	3-2	5x4.7	4	QWD OUT	504	TX	
31	1 IND-S3	5854	122	122	23429	6.00	20175	7.50/18-10	Own	8-3	32	221	1.50	85-3800	3-2	5x4.7	4	QWD OUT	504	TX	
32	1 IND-S3	5854	122	122	23429	6.00	20175	7.50/18-10	Own	8-3	32	221	1.50	85-3800	3-2	5x4.7	4	QWD OUT	504	TX	
33	Conn. Car 11C-S3	5854	122	122	23429	6.00	20175	7.50/18-10	Own	8-3	32	221	1.50	85-3800	3-2	5x4.7	4	QWD OUT	504	TX	
34	Conn. Car 11C-S3	5854	122	122	23429	6.00	20175	7.50/18-10	Own	8-3	32	221	1.50	85-3800	3-2	5x4.7	4	QWD OUT	504	TX	
35	Grand 11A	605	131	155	2860	2860	7.50/16-16.5	7.50/16-16.5	Her QNB3G	6-3-4	316.5	15.44	66-3500	7-2-13/14	Y WG T32	3	Spd. 541.1	57	T		
36	(c.o.e.) 21A	745	131	155	16000	6000	20175	7.50/16-16.5	Her CNB3G	6-3-4	316.5	15.44	66-3500	7-2-13/14	Y WG T32	3	Spd. 541.1	57	T		
37	(c.o.e.) 31A	745	131	155	16000	6000	20175	7.50/16-16.5	Her CNB3G	6-3-4	316.5	15.44	66-3500	7-2-13/14	Y WG T32	3	Spd. 541.1	57	T		
38	(c.o.e.) 31A	865	131	155	16000	6000	20175	7.50/16-16.5	Her CNB3G	6-3-4	316.5	15.44	66-3500	7-2-13/14	Y WG T32	3	Spd. 541.1	57	T		
39	(c.o.e.) 31A	865	131	155	16000	6000	20175	7.50/16-16.5	Her CNB3G	6-3-4	316.5	15.44	66-3500	7-2-13/14	Y WG T32	3	Spd. 541.1	57	T		
40	(c.o.e.) 31A	1065	131	155	16000	6000	20175	7.50/16-16.5	Her CNB3G	6-3-4	316.5	15.44	66-3500	7-2-13/14	Y WG T32	3	Spd. 541.1	57	T		
41	(c.o.e.) 71A	1265	131	155	16000	6000	20175	7.50/16-16.5	Her CNB3G	6-3-4	316.5	15.44	66-3500	7-2-13/14	Y WG T32	3	Spd. 541.1	57	T		
42	(c.o.e.) 71A	1265	131	155	16000	6000	20175	7.50/16-16.5	Her CNB3G	6-3-4	316.5	15.44	66-3500	7-2-13/14	Y WG T32	3	Spd. 541.1	57	T		
43	(c.o.e.) 86A	1865	131	155	16000	6000	20175	7.50/16-16.5	Her CNB3G	6-3-4	316.5	15.44	66-3500	7-2-13/14	Y WG T32	3	Spd. 541.1	57	T		
44	(c.o.e.) 86A	1865	131	155	16000	6000	20175	7.50/16-16.5	Her CNB3G	6-3-4	316.5	15.44	66-3500	7-2-13/14	Y WG T32	3	Spd. 541.1	57	T		
45	(c.o.e.) 96A	2430	131	155	16000	6000	20175	7.50/16-16.5	Her DDXB	6-3-4	316.5	15.44	66-3500	7-2-13/14	Y WG T32	3	Spd. 541.1	57	T		
46	(c.o.e.) 96A	2430	131	155	16000	6															





77	(c.f.)	ADK	10000	126	138	300000	120000	10000	10000	24D	11.00	9.75/22	Con E603	6-4-3x4	383.5	6.280	104-2400	7-2-4x13	N Fu 5A430	5 TI SBT1507W SF	A 6.06-7-40	T1 33000TW	WS61A	630 1094 A
78	(c.f.)	ADV	11000	138	162	35000	13000	11000	10000	24D	12.00	9.75/22	Con A2244	6-3-3x4	320.0	5.325	125-2400	7-2-4x13	N Clia B116C	4 TI SBD800H SF	A 6.26-7-80	T1 31000TW	WS61A	585 1093 B
79	(c.f.)	ADV	13300	126	162	65000	17000	14000	12000	24D	13.00	9.75/22	Con A2244	6-3-3x4	244.5	4.170	87-2800	7-2-4x13	N Clia B116C	4 TI SBD800H SF	A 5.14-6-60	T1 30020H	L61HV	382 1093 C
80	81 Ward Ls Fr... 81	204	7650	156	Op1	50000	13000	10365	10365	24D	12.00/24	Wau SHKR	6-4-3x5	517.5	5.0365	126-2400	7-3x13%	Y Fu 5A620	9 Ws 1575W	S *-9-20	Wu F427W	WS61A	585 1093 T	
82	<b>Six-Wheelers</b>		Cor-bit(10)5SB2	2F	4800	Opt	35000	9100	9400	20D	9.75/22	Con E603	6-4-3x4	383.5	6.280	104-2400	7-2-4x13	N Fu 5A430	5 TI SBT1507W SF	A 6.06-7-40	T1 33000TW	WS61A	630 1094 A	
83	Cor-bit(10)5SB2	2F	4800	Opt	OP	OP	18000	10000	9750	20D	10.50/22	Con A2244	6-3-3x4	320.0	5.325	125-2400	7-2-4x13	N Clia B116C	4 TI SBD800H SF	A 6.26-7-80	T1 31000TW	WS61A	585 1093 B	
84	(10) 15SB2	4R	3500	Op1	OP	OP	18000	10000	9750	20D	7.50/20	Con A2244	6-3-3x4	200.5	5.205	87-2800	7-2-4x13	N Clia B116C	4 TI SBT1507W SF	A 5.14-6-60	T1 30020H	WS61A	585 1093 C	
85	(10) 15SB2	2F	2000	Opt	OP	OP	18000	10000	9750	20D	7.50/20	Con A2244	6-3-3x4	200.5	5.205	87-2800	7-2-4x13	N Clia B116C	4 TI SBT1507W SF	A 5.14-6-60	T1 30020H	WS61A	585 1093 C	
86	(10) 15SB2	2F	2150	Opt	OP	OP	25000	5700	5700	20D	9.00/20	Con M620	6-3-3x4	200.5	5.205	87-2800	7-2-4x13	N Clia B116C	5 TI SBT1500W SF	A 5.14-6-60	T1 30000TW	WS61A	574 1093 D	
87	(10) 15SB2	2F	2150	Opt	OP	OP	25000	5700	5700	20D	9.00/20	Con M620	6-3-3x4	200.5	5.205	87-2800	7-2-4x13	N Clia B116C	5 TI SBT1500W SF	A 5.14-6-60	T1 30000TW	WS61A	574 1093 D	
88	(10) 15SB2	4R	6350	Op1	OP	OP	25000	9000	8750	20D	9.00/20	Con E603	6-3-3x4	383.5	6.280	104-2400	7-2-4x13	N Clia B116C	5 TI SBT1500W SF	A 5.14-6-60	T1 30000TW	WS61A	574 1093 D	
89	(10) 15SB2	4R	6350	Op1	OP	OP	35000	10000	9000	20D	9.00/20	Con E603	6-3-3x4	383.5	6.280	104-2400	7-2-4x13	N Clia B116C	5 TI SBT1500W SF	A 5.14-6-60	T1 30000TW	WS61A	574 1093 D	
90	(10) 15SB2	4R	8800	Op1	OP	OP	40000	11000	9750	20D	6.50/20	Con A2244	6-3-3x4	250.5	4.155	104-2400	7-2-4x13	N Clia B116C	5 TI SBT1500W SF	A 5.14-6-60	T1 30000TW	WS61A	574 1093 D	
91	(10) 15SB2	6	5500	Op1	OP	OP	40000	8500	8000	20D	6.50/20	Con A2244	6-3-3x4	250.5	4.155	104-2400	7-2-4x13	N Clia B116C	5 TI SBT1500W SF	A 5.14-6-60	T1 30000TW	WS61A	574 1093 D	
92	(10) 15SB2	6	5500	Op1	OP	OP	40000	8500	8000	20D	6.50/20	Con A2244	6-3-3x4	250.5	4.155	104-2400	7-2-4x13	N Clia B116C	5 TI SBT1500W SF	A 5.14-6-60	T1 30000TW	WS61A	574 1093 D	
93	(10) 15SD6	6	5500	Op1	OP	OP	40000	14000	13500	20D	10.50/22	Con A2244	6-3-3x4	517.5	5.0365	126-2400	7-3x13%	N Clia B116C	5 TI SBT1500W SF	A 5.14-6-60	T1 30000TW	WS61A	574 1093 D	
94	(10) 15SD6	6	5500	Op1	OP	OP	40000	14000	13500	20D	10.50/22	Con A2244	6-3-3x4	517.5	5.0365	126-2400	7-3x13%	N Clia B116C	5 TI SBT1500W SF	A 5.14-6-60	T1 30000TW	WS61A	574 1093 D	
95	(10) 15SD6	6	5500	Op1	OP	OP	40000	14000	13500	20D	10.50/22	Con A2244	6-3-3x4	517.5	5.0365	126-2400	7-3x13%	N Clia B116C	5 TI SBT1500W SF	A 5.14-6-60	T1 30000TW	WS61A	574 1093 D	
96	Dart	1000	4R	4050	161	288	24500	842.5	824.5	20D	9.75/20	Her IXD	6-4-3x4	320.5	4.204	106-2800	7-2-4x13	Y Fu 5A330	5 TI SBT1500W SF	A 5.14-6-60	T1 30005TW	L61HV	537 1093 E	
97	Dart	1150	4R	5200	161	288	24500	732.5	714.5	20D	9.75/20	Her IXD	6-4-3x4	320.5	4.204	106-2800	7-2-4x13	Y Fu 5A330	5 TI SBT1500W SF	A 5.14-6-60	T1 30005TW	L61HV	537 1093 E	
98	...222	4R	5600	152	288	33000	10000	9750	20D	9.00/20	Her WXC	6-4-3x4	320.5	4.204	106-2800	7-2-4x13	Y Fu 5A330	5 TI SBT1500W SF	A 5.14-6-60	T1 30005TW	L61HV	537 1093 E		
99	...332	4R	98550	156	261	33000	15594	9.75/20	20D	10.50/24	Her RXLX	6-4-3x5	558.5	9.410	144-2200	7-3x14	Y Fu 5A330	5 TI SBT1500W SF	A 5.14-6-60	T1 30005TW	L61HV	537 1093 E		
100	Diamond-T	4R	2950	174	224	24500	8600	7.50/20	20D	9.75/22	Her CB116C	6-3-3x4	322.5	9.224	86-2800	7-2-4x10	Y Sp1 231	5 TI SBD1500W SF	R Opt.	T1 30000H	L61HV	535 1093 F		
101	6128BD1000	4R	3850	175	225	32000	9500	8250	20D	9.75/22	Her CJ1XD	6-3-3x4	322.5	9.224	86-2800	7-2-4x10	Y Sp1 231	5 TI SBD1500W SF	R Opt.	T1 30000H	L61HV	535 1093 F		
102	7028BD1500	4R	53256	168	222	32000	11000	9750	20D	9.75/20	Her CJ1XD	6-3-3x4	322.5	9.224	86-2800	7-2-4x10	Y Sp1 231	5 TI SBD1500W SF	R Opt.	T1 30000H	L61HV	535 1093 F		
103	7028BD2000	4R	53256	168	222	32000	12000	8500	20D	9.75/20	Her CJ1XD	6-3-3x4	322.5	9.224	86-2800	7-2-4x10	Y Sp1 231	5 TI SBD1500W SF	R Opt.	T1 30000H	L61HV	535 1093 F		
104	8068BD1500	4R	58818	168	222	32000	12000	9000	20D	9.75/20	Her CJ1XD	6-3-3x4	322.5	9.224	86-2800	7-2-4x10	Y Sp1 231	5 TI SBD1500W SF	R Opt.	T1 30000H	L61HV	535 1093 F		
105	8068BD2000	4R	72315	168	222	32000	13000	9000	20D	9.75/20	Her CJ1XD	6-3-3x4	322.5	9.224	86-2800	7-2-4x10	Y Sp1 231	5 TI SBD1500W SF	R Opt.	T1 30000H	L61HV	535 1093 F		
106	9068BD1000	4R	78310	168	222	32000	14000	9340	20D	9.75/20	Her CJ1XD	6-3-3x4	322.5	9.224	86-2800	7-2-4x10	Y Sp1 231	5 TI SBD1500W SF	R Opt.	T1 30000H	L61HV	535 1093 F		
107	9068BD1000	4R	78310	170	224	32000	15000	9650	20D	10.50/24	Her CJ1XD	6-3-3x4	322.5	9.224	86-2800	7-2-4x10	Y Sp1 231	5 TI SBD1500W SF	R Opt.	T1 30000H	L61HV	535 1093 F		
108	...9068BD1000	4R	9780	170	224	32000	15000	9650	20D	10.50/24	Her CJ1XD	6-3-3x4	322.5	9.224	86-2800	7-2-4x10	Y Sp1 231	5 TI SBD1500W SF	R Opt.	T1 30000H	L61HV	535 1093 F		
109	Federal	202	1950	162	215	21000	6650	7000	20D	7.50/20	Her IXD	6-3-3x4	263.5	6.187	82-3000	7-2-4x10	Y WG T9	4 Tim SBT800 SF	R Opt.	T1 30000H	L61HV	475 1093 G		
110	Federal	202	204	4R	25450	162	215	25000	7200	7000	20D	7.50/20	Her IXD	6-3-3x4	263.5	6.187	82-3000	7-2-4x10	Y WG T9	4 Tim SBT800 SF	R Opt.	T1 30000H	L61HV	475 1093 G
111	...204	4R	25450	162	215	25000	7200	7000	20D	7.50/20	Her IXD	6-3-3x4	263.5	6.187	82-3000	7-2-4x10	Y WG T9	4 Tim SBT800 SF	R Opt.	T1 30000H	L61HV	475 1093 G		
112	...204	4R	25450	162	215	25000	7200	7000	20D	7.50/20	Her IXD	6-3-3x4	263.5	6.187	82-3000	7-2-4x10	Y WG T9	4 Tim SBT800 SF	R Opt.	T1 30000H	L61HV	475 1093 G		
113	...204	4R	25450	162	215	25000	7200	7000	20D	7.50/20	Her IXD	6-3-3x4	263.5	6.187	82-3000	7-2-4x10	Y WG T9	4 Tim SBT800 SF	R Opt.	T1 30000H	L61HV	475 1093 G		
114	...204	4R	25450	162	215	25000	7200	7000	20D	7.50/20	Her IXD	6-3-3x4	263.5	6.187	82-3000	7-2-4x10	Y WG T9	4 Tim SBT800 SF	R Opt.	T1 30000H	L61HV	475 1093 G		
115	...532	2F	6140	167	220	36000	11100	9000	20D	10.50/20	Her WXLX	6-3-3x4	322.5	9.224	86-2800	7-2-4x10	Y WG T9	4 Tim SBT800 SF	R Opt.	T1 30000H	L61HV	475 1093 G		
116	...532	2F	6140	167	220	36000	11100	9000	20D	10.50/20	Her WXLX	6-3-3x4	322.5	9.224	86-2800	7-2-4x10	Y WG T9	4 Tim SBT800 SF	R Opt.	T1 30000H	L61HV	475 1093 G		
117	...534	4R	68225	167	220	36000	12000	8500	20D	10.50/20	Her WXLX	6-3-3x4	322.5	9.224	86-2800	7-2-4x10	Y WG T9	4 Tim SBT800 SF	R Opt.	T1 30000H	L61HV	475 1093 G		
118	...534	4R	68225	167	220	36000	12000	8500	20D	10.50/20	Her WXLX	6-3-3x4	322.5	9.224	86-2800	7-2-4x10	Y WG T9	4 Tim SBT800 SF	R Opt.	T1 30000H	L61HV	475 1093 G		
119	(c.e.) 802	4R	68225	167	220	36000	12000	8500	20D	10.50/20	Her WXLX	6-3-3x4	322.5	9.224	86-2800	7-2-4x10	Y WG T9	4 Tim SBT800 SF	R Opt.</					

† Rear 11.25/24.

New

Truck

Regis-

## tributions

hv

Males

Sept.  
Sept.

MARCH -

—SUNSHINE

118

States Asbestos Division  
Manhattan, Inc., Manheim,

Contents include: (1) the new National Safety Council Standard Truck Servicing Schedule; (2) specific recommendations for all makes and models of all trucks, buses, trailers and axles (including 1941 models); (3) servicing information on all truck, bus and passenger car brakes, and (4) a complete outline concerning all brake controls for hydraulic air booster.

卷之三

**J. A. Gilray Dies**

J. A. Gilray, former Packard truck sales executive, died Jan. 9 at Fort Lauderdale, Fla. He joined Packard as a truck salesman in 1916 and later was a distributor in Kansas and truck sales manager in Kansas

"THE RIGHT TRUCKS FOR YOUR TRADE"



# NEW 1941 CHEVROLET TRUCKS

MOST POWERFUL TRUCK ENGINES

IN THE LOW-PRICE FIELD

90-

HORSEPOWER  
STANDARD ENGINE

★

93-HORSEPOWER  
HEAVY DUTY  
"LOAD-MASTER"  
ENGINE

(Optional at extra cost on Heavy Duty trucks)



## MASSIVE NEW TRUCK STYLING

making these new 1941 Chevrolet trucks the best-looking as well as the best-performing trucks in the entire lowest price field.

### NEW LONGER WHEELBASE

### NEW RECIRCULATING BALL-BEARING STEERING GEAR

greatly reduces steering effort—brings true passenger car steering ease to truck operation.

### NEW, MORE COMFORTABLE DRIVER'S COMPARTMENT

with greatly increased leg room and better, form-fitting seat and back in cabs, giving much greater driver comfort.

**OUT-PULL  
OUT-VALUE  
OUT-SELL!**

60 MODELS . . . ON NINE LONGER WHEELBASES . . . A COMPLETE LINE FOR ALL LINES OF BUSINESS

CHEVROLET MOTOR DIVISION, General Motors Sales Corporation, DETROIT, MICHIGAN

## SHOWCASE

(CONTINUED FROM PAGE 42)

### New Electric Dynamometer

A new electric chassis dynamometer is offered by Ted Nagle Equipment Corp., Detroit, Mich. Built by the Electric Products Co., it is available in two standard models operating with three different styles of instrument panels. Each of the models feature an all-electric absorption unit of the eddy current type. Of particular interest is the unusual completeness of the testing equipment which even includes an automatic mileage tester. Remote finger tip control is another feature.

Model 900 rollers have a maximum tread of 85 in. and the roll assembly can support a rear axle load of 10,000 lb., while those of Model 1300 have a tread of 92 in. with a load capacity of 30,000 lb. The frame of each model is of channel iron, electrically welded. Extra-heavy-duty models for truck and bus use can be made to order.

### New-Type Wheel Analyzer

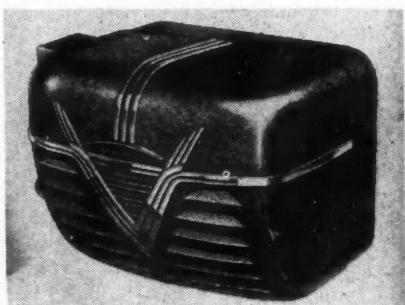
Featuring a dynamic check as part of the test procedure, a new front-wheel aligning device is available from The Testing Apparatus Co., Los Angeles, Cal. Mispositioned front and rear axle assemblies, a bent frame, twisted steering arms, and in-



correct caster, camber and toe-in are said to be quickly revealed by the rolling, or dynamic test, which compares the wheel path of travel with the path of travel of the car. Perfect alignment is indicated on the dial by a reading of zero.

### Improved Goodrich Heater

Greater heating capacity and increased efficiency are claimed for a complete new line of automobile heaters announced by The B. F. Goodrich Co., Akron, Ohio. Fea-



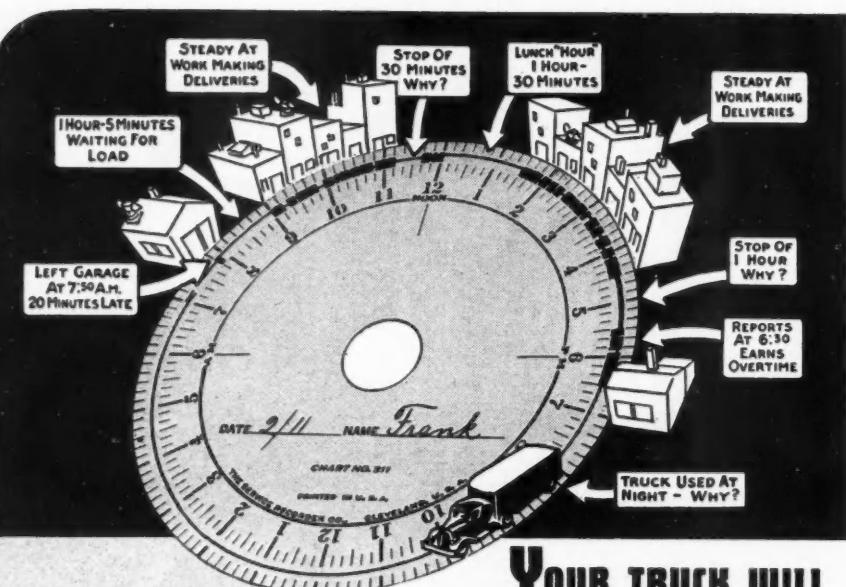
tured is model 401, shown above, providing 40 per cent greater heating efficiency than any previous Goodrich heater. The unit delivers 225 cu. ft. of heated air a minute, of which 35 cu. ft. can be directed to the windshield defroster.

### 4-Max Rubbing Compound

Performing four operations in one, 4-Max All-Purpose rubbing compound has been put on the market by the Formax Mfg. Co., Detroit, Mich. It is said to clean, rub down, polish and wax the finest enamel and lacquer finishes without danger of scratching, roughing or marking. Equally fine results are said to be produced when used on synthetic finishes.

### QUIZ ANSWERS (See Page 18)

- |   |        |
|---|--------|
| 1. b.   | 7. c.  |
| 2. a.   | 8. c.  |
| 3. a.   | 9. a.  |
| 4. b.   | 10. a. |
| 5. a.   |        |
| 6. c. (It is a motion picture dealing with highway carriers, produced by the Automobile Manufacturers Association.) |        |



**"Write its Own Diary" EACH DAY**

when equipped with the Servis Recorder

• Those heavy marks show busy time—i.e. when the truck was actually moving, and how long.

And where there are no heavy marks, that shows standing time—when and how long. And that's where you look longest, because that's where dollars can be saved.

Even half an hour a day in increased running time may amount to \$300 a year.

#### SIMPLE... AUTOMATIC... ACCURATE

How does the Servis Recorder write this "diary"? Not with a pencil, not with ink, but with a sapphire stylus that scrapes wax off the chart, and shows beneath where really important money can be saved.

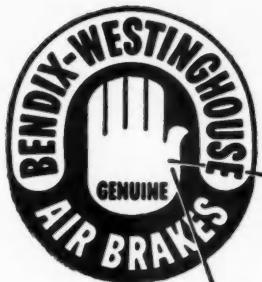
Attached merely by a couple of screws. Send for booklet: "Ten Ways of Getting More Work Out of Motor Trucks."

**THE SERVICE RECORDER COMPANY**  
1375 EUCLID AVE. • CLEVELAND, OHIO

**The Servis Recorder**

Tells Every Move Your Truck Makes





# THE HAND BEHIND THE FOOT THAT WORKS THE BRAKE

Consistently, year after year, the leadership of genuine Bendix-Westinghouse Air Brakes becomes more firmly imbedded in the American scheme of efficient transportation... and not without reason of the soundest sort ★ It so happens that genuine Bendix-Westinghouse Air Brakes have a habit of doing the control job modern transportation

demands more dependably, more economically and at an initial cost which is soon absorbed by their many exclusive advantages ★ There's a dozen reasons why you can't afford to be without this modern power-to-stop ★ Consult your local Distributor or address the Bendix-Westinghouse Automotive Air Brake Co., Pittsburgh, Pa.



**BENDIX-WESTINGHOUSE AUTOMOTIVE AIR BRAKES**

## A CHECK-UP OF FAST CHARGERS

(CONTINUED FROM PAGE 25)

confused if you get two thermometers together and they do not agree on the zero point of the correction scale.

The thermometers will agree on the temperature reading scale and the consensus seems to be that under no condition should the electrolyte in the center cell exceed 130 deg. while charging. Some manufacturers

hold out for a lower figure. It will not under proper charging procedure with any fast charger so if the thermometer climbs above that point you better look again at the instructions.

The testing apparatus on the fast chargers will tell you which batteries will take a fast charge and which ones will not. It will not tell you with 100 per cent accuracy whether the battery should be junked or not because some batteries can be salvaged with slow charging that the fast chargers will not handle. This

cannot be considered a drawback because there is no known method of determining this point without putting the battery on a slow charge. The battery manufacturers say that about half of the badly sulphated batteries will take a charge and hold it although it might be necessary to put 400 amp. hr. in the battery to do it. Fast charger manufacturers do not recommend attempting to charge any badly sulphated battery on their equipment.

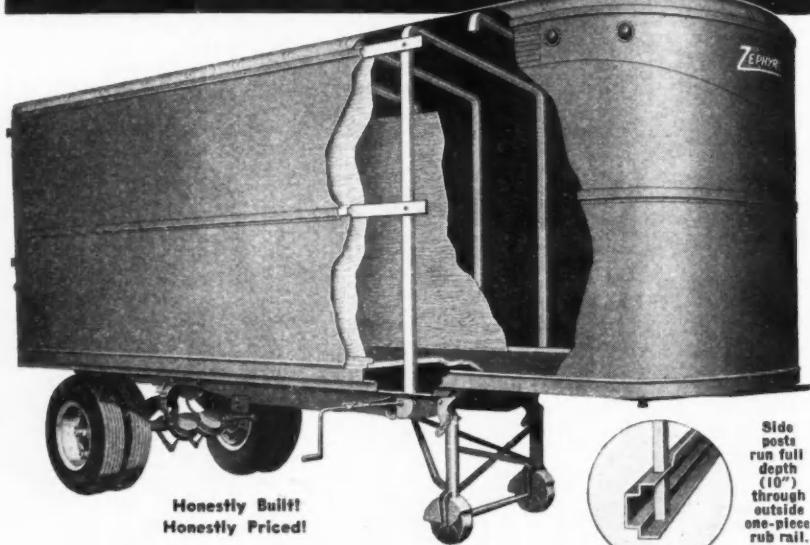
The major advantage the fast charger possesses is its ability to save time in charging a battery. Just how much time is saved is a matter of simple arithmetic. If a fast charger has a capacity of 80 amp. and a battery is charged by it for 1 hr., about 80 amp. hr. of current have been stored in the battery. Technically this is not entirely correct because either through mechanical design or just simply because of the rising resistance of the battery as it becomes charged, there is tapering off of the rate of charge. The same tapering off occurs with a slow charger to some degree.

On the same basis if a battery requires 80 amp. hr. and it is charged by a slow charger with a maximum capacity of 12 amp., it will take  $6\frac{2}{3}$  hr. to get that amount into the battery. The important point is not the straight mark up in time but the fact that the increased time makes charging an overnight job.

Then there is another item that should receive important consideration. With a slow charger it is necessary to test the battery, remove it if it needs a charge, replace it with a spare battery and place the battery on the charging line. Then when the battery is charged it is necessary to remove the spare battery, replace with the charged battery, test the spare battery and perhaps place it on charge. According to a survey of 300 shops this operation takes an average of 62 min. of labor. We may be giving the fast chargers a break when we set the time for testing the battery and applying the quick charger to it at 15 min. but we do not think so. Anyhow there is a substantial saving in labor when the fast charger is used and on the face of it the labor saving would appear to be the principal economy in using the fast charger. Cutting a labor opera-

(TURN TO PAGE 62, PLEASE)

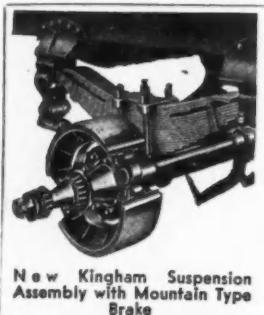
## The KINGHAM ZEPHYR STREAMLINED AMERICA'S GREATEST TRAILER VALUE



Honestly Built!  
Honestly Priced!

## CHECK THESE FEATURES

- The new Kingham Zephyr Body is made of die formed high tensile steel. All parts are interchangeable.



New Kingham Suspension Assembly with Mountain Type Brake

- Side and roof panels easily removed from outside
- Boxed section Hi-tensile steel posts give added strength
- Triple strength all-steel re-inforced center rub rails
- Lower rub rail made of Hi-tensile steel—formed in one piece to effect minimum weight and maximum strength
- Ship-lapped hardwood floor
- Three-ply veneer lining

Only KINGHAM can give you these up-to-the-minute mechanical improvements.

**"A Load Behind Is a Trip Ahead"**

NATIONAL SALES

**Kingham**  
UNIVERSAL

NATIONAL SERVICE

**KINGHAM TRAILER COMPANY**

INCORPORATED

LOUISVILLE,

KENTUCKY

# MULTI-FUEL ENGINE SAVINGS

**MEAN LESS FUEL, LOWER COST  
AND FASTER HAULING**

*says Natrona Transfer Co.*

It's a long pull and a tough pull... a 594-mile round trip... between Denver and Casper, Wyoming. Yet the Natrona Transfer Company's tractor truck, with its 83 hp. Waukesha Multi-Fuel Engine, goes over those mountain roads in 9 hours instead of the 10½ hours required with the original 95 hp. engine. That's 14.3% faster time! Hauling over 14,000 lb. payload, it does it on 12¢ fuel oil... 7.7 miles to the gallon. They got only 5 miles per gallon on 17½¢ gasoline, with the former engine. That's a Multi-Fuel Engine saving of 1.94¢ per mile on fuel alone—\$11.52 saved per trip. And the cost of upkeep is not increased!

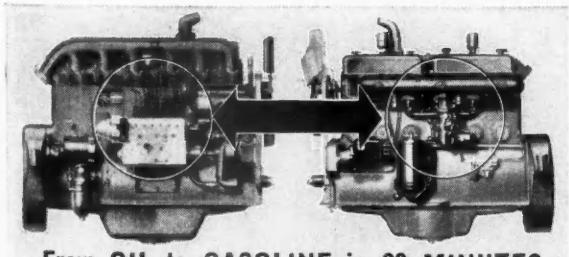
And the Multi-Fuel Engine is a standardized power plant. It can burn diesel oil, gasoline, or butane without internal changes or service maintenance complications. Write for Bulletin 1173-A.

WAUKESHA MOTOR COMPANY, WAUKESHA, WIS.  
NEW YORK                    TULSA                    LOS ANGELES



This advertisement  
is No. 6 of a Series.

# WAUKESHA



From OIL to GASOLINE in 20 MINUTES

*Multi-Fuel*  
**ENGINES**

(CONTINUED FROM PAGE 60)  
tion to 25 per cent of previous time  
should interest all fleet men.

To just what per cent of capacity  
a fast charger will charge a battery  
is a moot question. Figures vary  
from 60 per cent to 80 per cent de-  
pending upon whom you are talking to.  
Some of our more cautious engi-  
neers say that they would hate to  
guess at the percentage and when you  
consider that the battery capacity  
varies with age and condition as well  
as type and construction, you can

see their grounds for uncertainty.  
They point out that the only way you  
can tell if a battery is 100 per  
cent charged with a slow charger is  
to check it several times at hourly in-  
tervals until there is no specific grav-  
ity rise, then remove it from charge,  
let it stand for a period and then test  
it for voltage. All of this takes time  
and if the cause of the battery's run-  
ning down is remedied the vehicle  
generator can take over where the  
garage charger—either fast or slow  
—has left off.

There may be a difference in cur-  
rent costs between the fast and slow  
charger but, on the face of it, the  
electrical cost would appear to be the  
same. If 100 amp. hr. are needed to  
bring a battery up, it should make no  
difference whether you put them in  
at the rate of 10 amp. for 10 hr. or  
100 amp. for 1 hr. If the fast charger  
uses 220 volts, as many of them do,  
since much shop equipment requires  
220 volts and it is usually available,  
chances are that the current is  
bought at a slightly lower rate than  
if it were delivered at 110 volts.

Some manufacturers recom-  
mend that several batteries be  
charged at once on a fast charger  
when the occasion presents itself and  
other manufacturers specifically recom-  
mend that the fast charger should  
not be used for multiple charging.  
The reason given by the "against-  
ers" is that the battery with the  
greatest discharge hogs most of the  
current in a parallel hook-up which  
is necessary with a fast charger and  
there is a chance that this low bat-  
tery will receive too fast a charge for  
too long a time, resulting in damage.  
This is a matter to decide for your-  
self and it is pointless if you already  
have a slow charger. A thing to re-  
member is that when you start mul-  
tiple charging on a fast charger you  
slow it down in direct proportion to  
the number of batteries on charge.

There are a number of time, la-  
bor and money-saving circumstances  
in which a fast charger fits into fleet  
operation to advantage. They are:

- When a battery suddenly goes dead the fast charger can be used to revive the battery while the source of the trouble is being located and the truck can continue on its way without swapping batteries.

- When seasonal or continual current requirements are in excess of generator output and the battery needs periodical recharging, the charging can be done during inspection or lubrication without interference or additional labor.

- The inventory or spare batteries can be reduced because the spare batteries can be charged more promptly and thus they can be ready for service more of the time.

- When a 75 per cent reduction in the labor required for handling batteries with a slow charger amounts to more money than the depreciation on a fast charger.



"As long as you drive trucks  
for this outfit, you can depend on  
your radiators. We know how  
to fix 'em—right—with Kester  
Radiator Solder. Time was when  
we had a lot of expensive radi-  
ator trouble. But no more,  
thanks to Kester!"

Fleet mechanics in big shops  
everywhere have learned this  
same important fact: *Kester  
Radiator Solder virtually ends  
radiator troubles.* Once you fix  
a truck radiator with this *spe-  
cialized* solder, it stays fixed. And  
the work is done with a lot less  
trouble when you use Kester.

The special solder alloy is free-  
flowing and the flux, contained in  
the core of the solder itself, is  
compounded specifically for radi-  
ator work. These two elements  
insure perfect radiator repairs  
and save time and money on this  
vital part of motor-truck main-  
tenance.

When you order solder for this  
type of service, be sure to specify  
*Kester Radiator Solder* — and  
you'll get the best the market  
affords. When you judge it from  
the standpoint of the results you  
get, you'll agree the price is very  
low.

#### KESTER SOLDER COMPANY

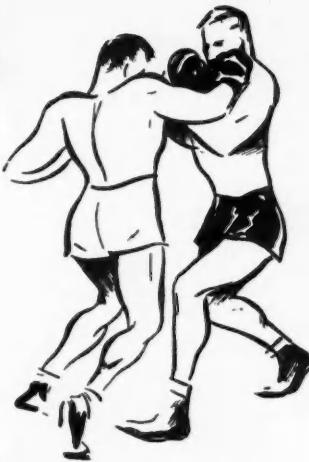
4205 Wrightwood Avenue  
Eastern Plant: Newark, N. J.

Chicago, Illinois  
Canadian Plant: Brantford, Ont.

## KESTER RADIATOR SOLDER

**4-POINT POSITIVE DRIVE**

... gives the SNOW-FIGHTER  
what FOOTWORK gives the boxer



It takes *footwork* to put power in the punch of a champion. Likewise, it takes **100% Traction** to put power in the punch of a Walter Snow Fighter.

The amazing Walter traction is produced by our peculiar Four-Point Positive Drive. This is the result of the combination of automatic lock or torque proportioning differentials, suspended double reduction drive with high ground clearance and minimum unsprung

weight, scientifically correct weight distribution and tractor type transmission.

State, county and municipal road officials are finding the astonishing capacity of Walter Snow Fighters for work under punishing conditions, the best insurance for their communities against costly general traffic tie-ups.

**Send for Literature**

**WALTER MOTOR TRUCK CO.**  
1001-19 IRVING AVENUE, RIDGEWOOD, QUEENS, L. I., N. Y.

## STORE RESTORES DELIVERY

(CONTINUED FROM PAGE 35)

have accumulated a working knowledge of the territory. Personality and intelligence are rated above driving ability on the basis that they are inherent; driving ability can be developed. The store is strong in its belief that drivers can do much for the store as salesmen, and they are trained to think of themselves in this light. The bonus plan, explained below, has done much to stimulate this attitude among the drivers.

By the end of the first year of operation, Lansburgh's found itself with Washington's first 100 per cent cab-over-engine fleet of modern trucks—27 all told—plus a tractor and three semi-trailers used in shuttle operation between the store and the garage. Six of the trucks are medium sized furniture vans, the bulk of the others are the package type delivery units with easy-access doors on either side and provision for either front or rear unloading.

But there was another big step to be made. The fleet, as hurriedly organized was operating from very inefficient quarters and a new warehouse-garage contemplated as an absolute must if the delivery system was to be a success was designed and built from scratch to provide as nearly ideal conditions as were humanly possible for the size of the fleet. An outline of the floor plan is reproduced with this article and serves to indicate the high degree of success with which the dreams were fulfilled. The garage's great claim to fame is the fact that in it are incorporated just about everything, new or old, that can contribute to making the mechanical processes of delivery most efficient.

But just because the fleet had modern equipment was no assurance that it could or would run efficiently. Sixty-four cents out of every delivery dollar, Lansburgh officials figure, go into wages. So it was the payroll to which Lansburgh gave its greatest attention. Eighteen months after it tackled the problem in earnest it had lopped off seven per cent of its own original payroll established just after the delivery was taken back while at the same time volume had increased by 13 per cent. The reduction in pay roll was accomplished not by a reduction in drivers salaries, but

Route #	Date	Truck #	Driver	Helper			
Paid	CODs	Calls	Time In	Time Loaded	Left Pump		
Arrived at Rt. Boundary		Time at 1st stop		Return time to Rt. Bd.			
Actual Time	Boundary to Station	Arrived at Station		Mileage			
Arrived Return Room	Left Return Room		Time Out				
#	Tr	Bldg	Ti	Cum Ti	REMARKS	Ti To Next	Mileage

One of the Lansburgh time study forms (See Col. 2)

rather by an increase. Such a paradox was made possible chiefly through the elimination of unneeded helpers and the effective use of the store's bonus plan.

Originally Lansburgh drivers got \$25 a week plus overtime if and when needed. Drivers could not get extra money without working extra hours. Now they get a base pay of \$25 figured on the basis of 2½ cents a package for 1000 packages a week. This much is guaranteed whether they deliver this number or not. In addition they get a bonus of an additional 2½ cents for each package delivered over the 1000 figure.

Route time studies indicated that normal production on most of the routes, with reasonable effort, permits 200 deliveries a day or 1200 a week, permitting an extra \$5.00 a week for the driver within normal working hours. At peak seasons he still may work overtime and continue to draw his 2½ cents on each package delivered, raising his earnings as high as \$45.

Helpers have been eliminated on all but five of the most densely populated routes. Drivers had to be sold on the loss of the helpers. The company had to make sure it was an efficient step. Again the time studies came into play. So let's have a look at how these were made and what they accomplished.

One of the forms used in the studies is reproduced above and a cursory glance will at once reveal that pertinent facts with regard to the

route, date, driver, time of departure, time of arrival, etc., are listed at the top. Next, the column headings indicate the proper space for notation with regard to : (1) Stop number, (2) Type of transaction (C.O.D. or paid), (3) Type of building (apartment or private dwelling), (4) Time consumed by stop (5) Cumulative time out from garage, (6) Remarks, (7) Time on the road to the next stop, and (8) mileage between stops. Under the column headed "remarks" appeared anything pertinent to the trip including such comments as "lady not yet up; called from 2nd-floor window and asked driver to wait," or "Proper person to receive C.O.D. not home, asked driver to return Thursday."

With specific reference to the helper situation, below is the actual result of a time study taken on two successive days using in the first case 15 helpers, in the second case only five helpers.

The result, of course, was the permanent elimination of helpers on all but the five peak routes. Actually, the store was able to absorb nearly all these helpers in internal jobs or as relief drivers. Drivers were skeptical at first of having to do more work on their own but confronted with the time studies they could see that these studies contained many instances where drivers would return to the truck and have to wait for the helper. Helpers were often a hindrance rather than an asset.

(TURN TO PAGE 66, PLEASE)

Package Volume	Drivers	Helpers	Total Time (Hours)	Over or Under Time (Hours)	Salary Cost	Unit Cost (\$Salary Only)
2,375	15	15	270	2	\$108.70	\$ .0457
2,080	13	5	158	2½	68.87	.0331

Results of a time study on helpers (See Col. 3)



*Put a new "heart"*  
into any pepless,  
oil pumping truck motor with  
**SEALED POWER**  
INDIVIDUALLY ENGINEERED  
**PISTON RING SETS**

SEALED POWER engineers have made it easy to put new heart, new pep, new economy into any engine. By using Sealed Power Individually Engineered Ring sets, you can lick the worst oil pumper in your fleet—restore its original economy, bring back its pep and power, too. These great sets—now available for the most popular cars and trucks—feature rings chosen from hundreds of Sealed Power designs—rings that have been proved best for that particular engine. All sets contain easy-to-understand instructions. You'll like these sets. Try them in one engine in your fleet. Performance will encourage you to use them in all your engines ever afterwards.

**SEALED POWER CORPORATION, Muskegon, Michigan**  
Canadian Factory, Windsor, Ontario



*Piston Rings • Pistons • Pins • Expanders • Valves • Valve  
Parts • Sleeves • King Bolts • Bushings • Water Pumps  
Tie Rods • Front End Parts*



## (CONTINUED FROM PAGE 64)

As a further inducement for drivers to operate without helpers, a penalty system was set up which automatically cuts 20 per cent from the drivers bonus rate if a helper is used. Let us assume that on a somewhat better than average day a driver was to deliver 240 packages. At the 2½ cent rate he would receive \$6.00, but if he used a helper, the 20 per cent penalty would be invoked and he would receive only \$4.80.

On the other hand, if the delivery

volume exceeds the normal production rate (average 200 packages) by 40 per cent, the driver gets a helper without penalty.

Most important of all, the time studies brought home to drivers and company alike the importance of making every minute count. To the driver that means extra earnings under the bonus plan. To the store it means getting its full money's worth out of driver time.

The three biggest non-productive driver functions were:

(1) Selection time en route when the driver had made only a rough sort before leaving,

(2) Pre-occupation with delivery sheets while en route,

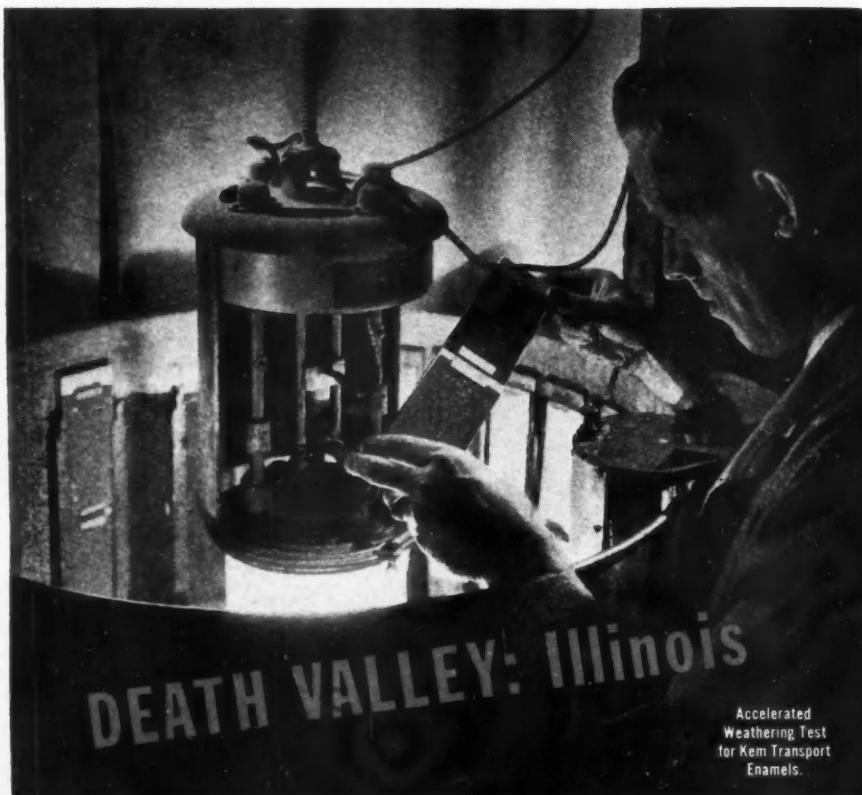
(3) The complicated settling of C.O.D. transactions when he completed the day's route.

Obvious solution to the first of these problems was fine sorting before departure. Each of the route package bins is roughly twice as big as the truck. When the driver reports for work he finds all of his packages stacked on one side of the bin. As he sorts for his route he puts them on shelves on the opposite side of the bin and then loads his truck in perfect order. It has been found that the driver is best suited for this job, since he knows the route best, and in the process becomes familiar with the particular load. The time studies show that the additional time required for the fine sorting is well offset by the savings in time while on route.

Paper work for the driver has been completely eliminated. He does not carry either a paid or C.O.D. route sheet. Both are now made out by the route men in the garage the previous afternoon and filed with the cashier.

An interesting example of internal time-saving is revealed in the method of posting the paid packages. Only the number on the ticket is used. Store records show the corresponding name and address and there is no need for duplication. But there is room for 400 numbers on the route sheets. Any inquiry with reference to a particular package previously necessitated the scanning of all 400 numbers. Hence the route sheet is now broken up into ten separately numbered sections. The last digit of each package number arbitrarily determines the section on which it is listed. Thus if the store wants to know if package No. 48267, going to such and such an address is being delivered that day, an attendant at the garage need only go to the proper route slip and scan the maximum of 40 numbers within the "7" area (since 7 was the last digit of the number) to determine whether that package is on the truck.

But the real paper work time saver comes from the revised and radically new system of simplified C.O.D. handlings. In the morning each



### —where Truck Finishes learn to live longer!

Death Valley, Illinois? Yes, this modern "torture chamber" for paint is in Chicago . . . right in the automotive laboratories of Sherwin-Williams. Here a sputtering carbon-arc gives Kem Enamels a dose of ultraviolet such as no truck finish absorbs in years of actual service.

That's not the only way we teach Kem Enamels to live longer on your trucks. They must be flexible enough to bend double over a ¼ inch rod without chipping! They must stand the repeated hammer-blows of the bump machine without loss of adhesion! They must endure weeks of 95% humidity. And they must stand

countless passes under abrasive wheels to prove their resistance to grit, sand, and scrubbing! That's why we know they'll live longer and look smarter on your fleet.

If your trucks are subjected to steady, hard service, refinish them with Kem. It may take a year to prove we're right, but you'll agree that your actual operating requirements are nothing to a finish that endured far worse hazards in our laboratories before a pint was sold!

For full data, color cards, etc., on Kem Transport Enamels, write to the Automotive Division, Sherwin-Williams Co., Cleveland, Ohio.



**SHERWIN-WILLIAMS**  
**KEM TRANSPORT ENAMEL**

driver draws a cash bag from the cashier with \$5 in change. Each C.O.D. package contains a red stub on which is entered the amount to be collected. All the driver has to do is to put the stub and the money into his bag. When he returns at night he hands in his unclaimed packages and the money bag. The cashier counts the money in the driver's presence and issues him a receipt for the cash. The driver is then through for the day. The cashier with both his advanced experience and an adding machine to help, totals the stubs and the unclaimed amounts on the packages returned. He then checks the total against the C.O.D. route slip made out the night before and against the cash, deducting, of course, for the \$5 in change. Experience has shown that the whole process takes the cashier no more time than he previously spent rechecking the driver balances, yet it saves the driver nearly one hour each day. During its first year in operation, the simplified cash handling plan cost the company a total in misplaced fund of only \$15.

Lastly, the time studies helped in the elimination of inefficient route planning. If, for instance, it was found that on any particular route the driver was finding an appreciable number of residents not yet up, that route was delayed an appropriate length of time before starting to compensate for that particular factor. In sections predominantly occupied by domestic help, it was found that Thursday afternoon was in many cases the only time at which C.O.D. deliveries would be accepted. Now the store salespeople, acting on advice from the delivery department, make every effort to time deliveries for the most efficient moment.

Although wages take account for 64 cents of the Lansburgh delivery dollar there's still 36 cents to be accounted for in physical equipment, rent, depreciation, supplies, etc. As a matter of fact, the records break it down something like this.

Depreciation, 4.9 cents; gas, oil and lubrication, 5.5 cents; rent, 2.3 cents; repairs, 7 cents; loss and damage, 2.7 cents; parcel post, 8.5 cents; truck hire (for packages outside the delivery area), 4.2 cents, and miscellaneous, 8.5 cents.

Rent for space in the new warehouse-garage is fixed; there is little

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When the driver steps out of his truck to make his cash settlement he leaves it in front of the gas pump just to the right of the main door. From here in Service Manager C. E. Alvey

or his assistant takes charge of the truck. Gas and oil are entered for each truck on the daily report and as the driver goes out he signs this same report, indicating whether or not he had experienced any mechanical difficulties. As soon as the truck is checked, it is then parked by the shop men at its proper station, ready for the next morning's loading. Each truck is washed on an average of twice a week, polished as frequently as shop schedules permit, and prob-

(TURN TO PAGE 72, PLEASE)

**CLOVER LEAF INTERSECTIONS  
MAKE FOR GREATER SAFETY**

**BUT.. IT STILL  
TAKES BRAKES TO STOP**

You've a lot at stake in your trucks' brakes. You can't save safely on safety. Ferodo Brake Blocks, supplied 3/8" and up in thickness, are molded of a special friction compound under enormous hydraulic pressure. They will not fade. Their ruggedness and longer life mean minimized brake maintenance cost. Write for the complete story.

*Ferodo for Road Safety*

**FERODO**  
BRAKE LININGS

FERODO AND ASBESTOS, INCORPORATED, NEW BRUNSWICK, N. J.

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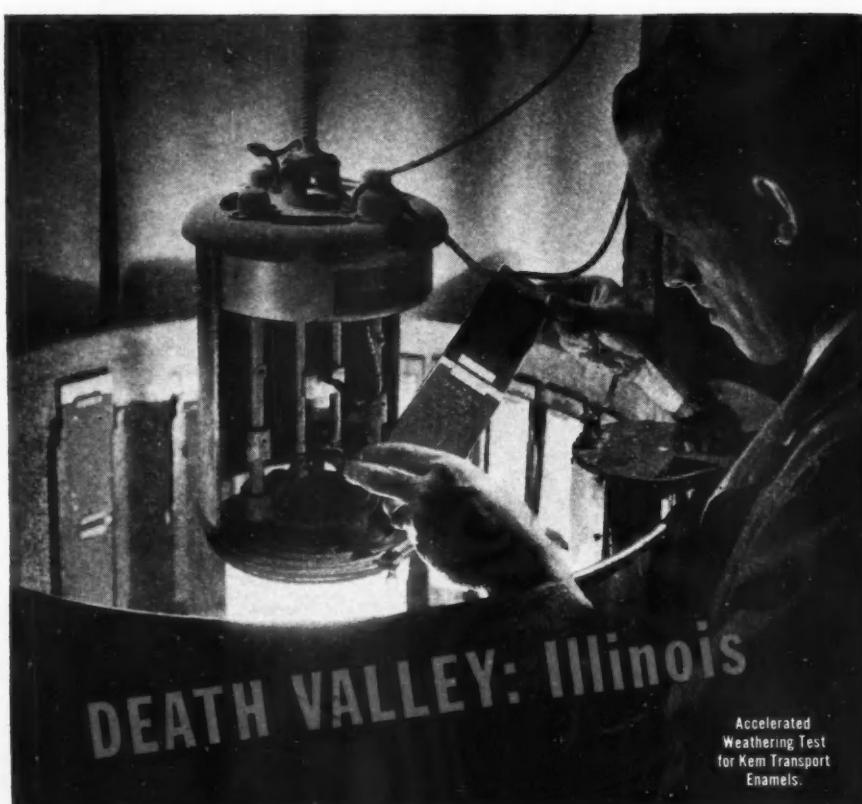
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MAKE FOR GREATER SAFETY**

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*Ferodo for Road Safety*

**FERODO**  
BRAKE LININGS

FERODO AND ASBESTOS, INCORPORATED, NEW BRUNSWICK, N. J.



## **THIS DELAY COST MORE**

**than new AC plugs for the entire fleet**

Those flares along the highway will *never* be caused by spark plugs if you always follow this simple formula,—

**1 Use AC Spark Plugs for proved reliability.**

**2 Be sure that the Heat Range is correct for the job.**

**3 Clean and regap all plugs every 4,000 miles.**

recommendations, and lay out schedules of cleaning and regapping at regular intervals. In every such case, the AC user has gotten longer life and better performance from his plugs, and marked freedom from service interruptions.

Standardize on AC Spark Plugs —of the correct Heat Range— cleaned and regapped every 4,000 miles, and you'll sharply reduce service interruptions, and the big cost that goes with them.

AC SPARK PLUG DIVISION • General Motors Corporation • FLINT, MICH.

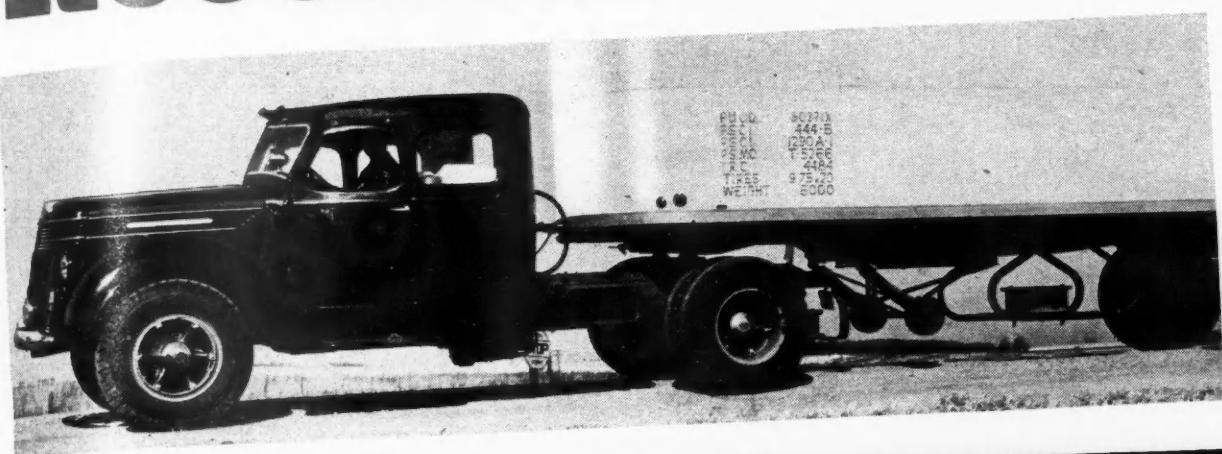
**More AC's are used as standard factory equipment than any other make of spark plug**

**For More Than 32 Years — THE QUALITY SPARK PLUG**

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COMMERCIAL CAR JOURNAL  
FEBRUARY, 1941

# Recommend it.."



## SERVICE FOR YOUR FLEET!

**1**

### YOUR PROBLEM IS ANSWERED!

Nothing is taken for granted, no step is overlooked. Socony-Vacuum's fleet engineer analyzes each of your vehicles—for load carried, routes, operating temperatures, exhaust gases, engine condition, maintenance methods. He then helps your men carry out money-saving operating and maintenance improvements.

**2**

### LUBRICANTS TO FIT!

Socony-Vacuum's engineers are not guided by guesswork. They base recommendations on scientific tests—select products for your equipment from Socony-Vacuum's famous Sovac Truck-Bus Oils, Mobilubes, and Mobilgreases.

**3**

### 75 YEARS' EXPERIENCE!

And every Socony-Vacuum fleet engineer has been trained to apply this experience—greatest in the oil business—to help you hold maintenance and operating costs to a minimum.

**4**

### NATION-WIDE SERVICE!

Across the U. S. A., you will find our fleet engineers available to recommend lubricants to meet all conditions on your routes. SOCONY-VACUUM OIL CO., INC., and Affiliates: Magnolia Petroleum Co., General Petroleum Corporation of California.

Address Truck-Bus Division  
Socony-Vacuum Oil Co., Inc.  
26 Broadway, New York City



# Fleet Engineer

(CONTINUED FROM PAGE 70)  
ably will be repainted in Lansburgh's distinctive light chocolate brown color on an average of once every two years. Fleet appearance is definitely good.

The two sets of preventive maintenance schedules shown in the accompanying lists are adhered to closely. Schedule "A" covers principally lubrication and is applied to each truck at 1000 mile intervals. At the second thousand-mile interval

schedule "A" is again followed, and in addition schedule "B" which involves a thorough check of mechanical adjustments and condition. As a part of this inspection, any repairs not possible at the time, are noted and the truck routed to the shop for major repairs as soon as practicable.

The shop itself, located at the upper right-hand corner of the garage as the layout is reproduced, contains a lift, lubricating equipment, an air compressor whose lines are piped

## LANSBURGH PREVENTIVE MAINTENANCE AND LUBRICATION SCHEDULES

### A—Lubricate

(On White Tag—1000-mile Interval)

- Distributor Head
- Generator: Horn: Starter
- Water Pump Shaft
- Brake Rod Connections
- Clutch Shifter Bearing
- Door Hinges and Locks
- Alemite Connections
- Steering Gear
- Steering Sector Shaft
- Universal Joints
- Transmission
- Differential
- Front Wheels
- Rear Axle Bearings
- Chassis Lubricator
- Test Battery
- Test Tires

### B—Check & Repair

(On Red Tag—2000-mile Interval)

- Clean Carburetor
- Clean Gas Lines
- Clean Fuel Pump
- Check Ignition
- Check Plugs
- Check Valves (Clearance)
- Check Compression
- Check Lights
- Check Brakes
- Check Generator
- Check Starter
- Check Battery
- Check Steering
- Check Wiper
- Check Oil Filter
- Check Air Cleaner

# Make Your Jobber Talk!



**He's got sensational news for you on  
LINK-BELT ROLLER BEARINGS!**



THE PERFECT  
REPLACEMENT  
FOR  
FRONT WHEELS  
DIFFERENTIALS  
AND REAR AXLES

We don't suggest a "third degree" but we do know that you'll learn something very much to your advantage by asking your jobber to explain why Link-Belt roller bearings are able to give such amazing performance. He will show you why by telling you how the exclusive convex-concave rollers and raceways assure constantly smooth action and compensate for wear so that this bearing lasts far longer. On your next job—be sure to replace with Link-Belt roller bearings.

8399-A

### LINK-BELT COMPANY

519 N. Holmes Ave., Indianapolis, Indiana  
Warehouses in all principal trading centers

Made by the makers of the famous  
Silverstreak Silent Timing Chain!

**LINK-BELT  
SHAFTER  
ROLLER BEARINGS**

to conveniently located outlets throughout the garage, and all necessary equipment needed for overhaul up to the point of rebore. When reboring is necessary, the job is done by a specialist who brings his equipment to the Lansburgh shop. Engine replacements have not occurred and are not contemplated under a plan of systematic truck replacement which calls for depreciation on a five-year basis.

At from 2,000 to 5,000 mile intervals, crankcase oil samples are shipped in special containers to an oil testing laboratory for analysis. All trucks are equipped with replaceable cartridge filters and oil and filter changes are made wholly on the recommendation of the laboratory, which sends a detailed report of the analysis with recommendations not only with regard to oil change, but also with regard to filter conditions, crankcase temperatures, dilution, metal contents, etc. Lansburgh officials feel that this service definitely pays for itself in savings both on oil purchases and truck maintenance.

(TURN TO PAGE 74, PLEASE)



• We know all the excuses for not keeping your fleet painted—they have to keep rolling—you're waiting for the right kind of weather—you can't decide on a new color scheme.

But after all, well-painted rolling stock is your outdoor advertising. You are judged by its eye appeal. Decrepit jalopies advertise you, too. They advertise your short-comings. They brand you as slip-shod, unreliable, unsuccessful. They hurt your business.

So paint up! Touch up the scratches. Get back the old shiny finish. Any fleet owner can organize for constant periodic paint maintenance at low cost with DeVilbiss Spray Painting Equipment. Improved modern spraying methods and quick-drying finishes permit perfect maintenance without costly lay-ups. Let us submit a plan that will fit into your fleet operating schedules.

**THE DEVILBISS COMPANY • TOLEDO, OHIO**  
Canadian Plants: WINDSOR, ONTARIO

# DEVILBISS SPRAY SYSTEMS

SPRAY-PAINTING OUTFITS for touch-up and repaint jobs.

HOSE FOR ALL USES  
—Air, oil, water, welding, car heater.

HOSE CONNECTIONS—Permanent or quick detachable types.

AIR COMPRESSORS—For every requirement.

OIL GUNS for high speed chassis lubrication. Spray or stream types.

AIR DUSTING GUNS for removing dust, water, metal chips.

SPRAY BOOTHS—Remove dust, spray vapors. Improve finishing, and shop conditions.

(CONTINUED FROM PAGE 72)

A maintenance history of each truck is kept on a master control sheet (for each vehicle). On this sheet, 12 x 17 in. and punched for a loose-leaf binder, a space is provided for entry of route and miles traveled, together with gas and oil consumed for each day in the year. In addition there are spaces to enter service operations on each of 33 major parts. A monthly summary provides room for recapitulation of truck costs including fixed charges,

and finally a yearly summary showing, total repair cost, total labor cost (pro rated) total mileage, and cost of maintenance per mile.

The man responsible for all of Lansburgh's efficient delivery system is Delivery Superintendent Irving Feden. Possessor of a wealth of experience in internal delivery management, he makes no bones about his lack of previous practical experience in the operation of trucks. But like many an intelligent beginner who shows up the old salts by the applica-

tion of good common sense free from preconceived notions and fetishes, he has lost no time in digging in.

Take for instance the matter of rear axle ratios. Since the store had no previous experience with the package type trucks, the manufacturer was asked to make a careful study of load and territory conditions and make his own selection. This was accepted by the store. But after 18 months of operation the records showed the manufacturer's judgment was wrong. Ratios were too low, and trucks spent too much time in the low gears, and so accurate were Lansburgh records that the manufacturer was convinced. The store is putting in the new gears but the manufacturer supplied them without charge. That's just an example of Lansburgh thoroughness.

Currently time studies are being made that will influence future truck selection. The furniture trucks for instance, although the newest in the fleet, are revealing considerable losses in unloading time. Provision for front unloading for all but the largest pieces will probably be made when trucks are replaced—perhaps much sooner than originally planned. New-type package trucks where the driver saves an extra step up, and stands for most of his driving, may save an accumulated half-hour a day, and pay for even premature replacements.

Lansburgh officials make no blanket statements with regard to independent vs. consolidated deliveries. But in cold fact, they are proving that under the right circumstances and in the right places, the independent system can and does pay big dividends.

## Completes 700,000 Mile Record

Without  
an  
**ACCIDENT!**

"Preparedness is the root of prevention. The American Safety Tank on my Truck is an assurance of preparedness against the most dangerous highway catastrophe—FIRES"

Ray Aubuchon



Says this record-holding  
Driver for  
BE-MAC Transport Co., Inc.  
St. Louis, Mo.



### **American Safety Tanks DO Prevent FIRES**

Specify  
American Safety  
Tanks

on your new trucks  
—pay for them with  
Insurance Savings!

Write for full explanation of how highly crash-resistant, spillproof and non-explosive are these tanks—how they will save you money and mean more profit.

**ROAD PROVED**  
By Men Who  
Use Them



**American Safety Tank Co.**

AGAINST TRUCK FIRES FOR DRIVER, LOAD AND OUTFIT

Underwriters Laboratories, AU1302

KANSAS CITY, MISSOURI, U.S.A.



At night, we put the tractors in them—saves garage space!

# Van Norman Announces

## THE NEW NO. 555

### MULTI-PURPOSE HORIZONTAL SURFACE GRINDER . . .



All cylinder heads and manifolds should be reconditioned before installing on the motor. For due to extreme heat, these surfaces are all distorted, sometimes .020" and more. And if replaced without reconditioning . . . blow-by or cylinder-wall and valve-port distortion results . . . an otherwise perfect overhauling job is spoiled.

Van Norman No. 555 brings new speed and accuracy to cylinder-head, manifold, motorblock top, and other flat-surface reconditioning. One job that normally takes five hours was accurately finished in twelve minutes . . . while the average cylinder head is accurately reground in five to ten minutes. What's more, cracked heads and manifolds may be salvaged by welding, then grinding on No. 555.

Check the features at the right . . . then write today for prices on this new Van Norman Quality Machine.

#### Highlighting the News on No. 555

1. Plenty of weight to assure accuracy and rigidity . . . 800 lbs.
2. 2 HP motor provides overload capacity. Direct drive to precision ground, heavy duty spindle, mounted on totally enclosed, pre-loaded, pre-lubricated ball bearings.
3. Table of special close-grained alloy. Heavy-ribbed, finished to micrometer accuracy.
4. Vacuum cleaner (½ HP motor) standard equipment to clear chips and dust.
5. Special 11" abrasive wheel, steel backed. Safe, long-lived. Wheel level is micrometer-controlled. Quiet operation.
6. No jigs or fixtures . . . Your hands are your only setup tools. Just move work back and forth across the wheel. So simple even your first job will be commercially perfect.
7. No. 555 comes complete, ready to go to work right now!

**QUALITY**  
IS THE REASON  
WHY . . .

VAN NORMAN MACHINE TOOL COMPANY, SPRINGFIELD, MASS.

*It pays to  
Van Normanize*

## RETAILERS TALK TRUCKS

(CONTINUED FROM PAGE 36)

considerable attention at the convention sessions in view of the magnitude of their services rendered to the retail store field. Morris Forgash, vice-president of Universal Carloading & Distributing Co., New York, told of the legal buffeting about that motor forwarders have taken since the case of the Acme Fast Freight application in 1936, in which the In-

terstate Commerce Commission's decision that forwarders did not come within the jurisdiction of the Motor Carrier Act was upheld by the Supreme Court. On July 24, 1939, the Commission ordered the tariffs of these forwarders to be stricken from their files effective Oct. 10, 1939. On the Commission's own volition, however, this effective date was postponed seven separate times, but now stands as Feb. 28, 1941, with a strict warning that no more postponements will be forthcoming.

Meanwhile, Senators Reed and Wheeler have been trying to break through the pressure of national defense measures to secure enactment of new legislation which would provide for regulation of the forwarders by the ICC. Failing to secure enactment of either permanent or temporary bills in the 1940 session, a new bill was finally introduced in the Senate on Jan. 7. Details of the entire bill are not available, but any bill which seeks to secure the permanent position of the forwarder must, according to Mr. Forgash, speaking for the industry, contain these four vital principles:

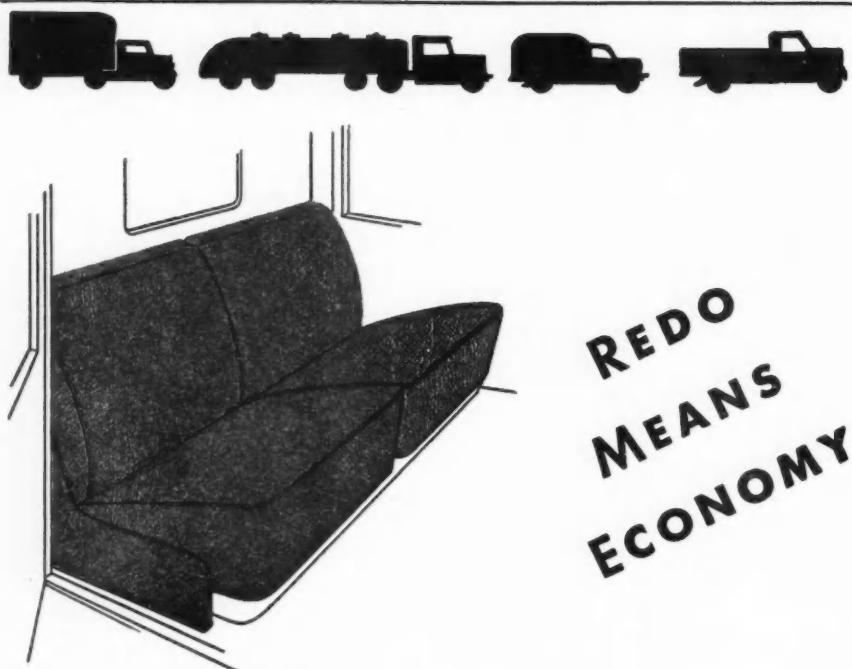
1. Regulate forwarders as common carriers under jurisdiction of the ICC.
2. Operations to be conducted in accordance with certificate of public convenience and necessity.
3. Permissive, but not compulsory, joint rates and arrangements with other regulated carriers.
4. Relations with other regulated carriers to be placed under jurisdiction of the ICC.

Both the American Trucking Association, Inc., and the National Industrial Traffic League, the latter representing major shipping interests in the United States, have gone on record as favoring such regulation.

Predicting transportation problems that may be expected as a result of increased national defense activities, Arthur D. Bibb, traffic manager of Halle Bros. Co., Cleveland, reminded members that one to three weeks' delivery on merchandise from New York was the rule rather than the exception during the last World War. He predicted that a transportation barrier may well be expected to stretch across the industrial midwest in a line approximating the direction of Buffalo, Cleveland, Pittsburgh and Wheeling. Although no one was able to predict the part that motor truck may be able to play in circumventing the bottleneck, men from the midwest recalled developments of the World War in which shipments were taken by truck to points along the Hudson and then shipped by rail from there, avoiding the acute terminal tie-ups in New York.

Personnel problems, always a subject of interest to the delivery man, have also been sharpened by the de-

(TURN TO PAGE 81, PLEASE)



... that means a lot to fleet owners!

Learn about this leather-like coated fabric's sturdiness . . . resistance to cracking and peeling . . . all-around durability. Easy to keep clean.

For an upholstery fabric to give real service and economy specify CHASE REDO!

**CHASE L. C. CHASE AND COMPANY**  
**295 FIFTH AVENUE, NEW YORK CITY**

Branches: Boston Detroit Chicago Los Angeles Mills at Sanford, Me. Reading, Mass. Troy, N.H.



(CONTINUED FROM PAGE 78)

fense industries. Many told of cases where drivers and other personnel had been lured from their jobs at the call of higher wages in defense industries as well as by the national draft. The most concrete solution to the problem was offered in the form of simplified personnel training, so that the expected large turnover could be handled with the minimum of effort and delay. As long as present draft laws were in effect, many of the men were looking to boys of 18 and 19 years of age as good potential material for at least two years of service.

Speaking briefly on the subject of accident reduction, Joseph Kord, operating-superintendent of Wm. Filene's Sons Co., Boston, told how his company had reduced accidents from a high of 62 for 42 vehicles in operation in 1935 to 16 in 1940 with approximately 50 vehicles in operation. Of the latter, only nine were of a chargeable nature, non-chargeable accidents being limited to those which occur while the vehicle is properly parked, or standing in line of traffic. He stated that all of his vehicles were governed to 38 m.p.h. and that all carried recording instruments which were used effectively to deduct idle time. Drivers are suspended for from one to 10 days for a chargeable accident, but so far none has ever been discharged for this reason. Each year no-accident drivers attend a banquet and at the end of the current fiscal year the insurance company is awarding a handsome plaque to the store paying tribute to the drivers' record.

One Akron operator was reported to have materially bettered his fleet's accident record by issuing a small bonus check for each 25 days of no-accident driving. Unusual feature of that plan was that the check was mailed direct to the driver's wife.

Delivery men, ever on the alert to reduce their department costs, also discussed methods of increasing the number of customers taking packages with them, thereby reducing the load on the company's trucks. One Pittsburgh firm reported using a brand-new nickel attached to each sales receipt. If the customer requested that the package be delivered, they forfeited the nickel. R. H. Macy, in New York, reported using signs ac-

companied by large pictures of a truck and driver saying "You take the small ones, we'll take the big ones" Contrarywise, many of the delivery superintendents present felt that the small reduction in delivery volume effected by such means—usually less than six per cent—actually did not reduce the number of trucks or drivers in operation and hence made little difference in the over-all delivery cost picture.

Three motion pictures of delivery and warehouse operations added to

the interest of several sessions. One, entitled "Spokes in a Wheel," was sponsored by United Parcel Service, New York, and depicted with excellent technique the multifarious functions of the organization. J. E. Carol, plant manager of United Parcel Service, was on hand to introduce the picture.

Another, accompanied by a paper prepared by Adam S. Dysert, warehouse manager of Lit Brothers, Philadelphia, portrayed the amazing com-

(TURN TO NEXT PAGE, PLEASE)

**There's Only One Way to KNOW  
THE POWER AND ECONOMY RANGE  
OF YOUR TRUCKS—**

**STEWART-WARNER MOTOR MILE TACHOMETER!**

*Owners Say*

**"SAVE UP TO 25%  
ON FUEL AND  
OIL EXPENSE!  
...and reduce maintenance  
costs at the same time!"**

**G**ASOLINE mileage stepped up 1.7 miles per gallon! 15,000 miles more service between overhauls! Maintenance costs reduced! These are *only a few of the results reported* by fleet owners following the installation of Stewart-Warner Motor Mile Tachometers!

These savings are a direct result of knowing the power and economy range—as shown by the two stationary red pointers on the tachometer—and keeping the motor speed within that range! This is easy for the driver to do—it's just a matter of keeping the tachometer pointer

between the two red pointers. And the Stewart-Warner Motor Mile Tachometer is the only instrument on the market which provides this vital information at all times!

Furthermore, this amazing instrument records r.p.m. in terms of *motor miles*, whenever motors are turning, making it possible for you to service trucks on a basis of actual *motor miles* instead of *road miles*—which may mean cutting repair bills as much as 25%!

Mail the coupon now for complete information!

# STEWART WARNER

MOTOR MILE  
TACHOMETER

STEWART-WARNER CORPORATION  
1876 Diversey Parkway • Chicago, Ill.

STEWART-WARNER CORPORATION  
1876 Diversey Parkway, Chicago, Ill., Dept. B  
I operate.... Trucks. Please give me all the facts about cutting my operating costs with Stewart-Warner Motor Mile Tachometers.

Name.....

Address.....

City..... State.....

Firm Name.....

(CONTINUED FROM PAGE 81)

completeness of that organization's new warehouse-garage. Lit Brothers is the last of the large Philadelphia department stores to operate its own delivery meeting the challenge of competition with this magnificent new building and a modern 140-truck fleet.

The third picture was presented by W. C. McDermott, traffic manager of Woodward & Lothrop, Washington, D. C. Chiefly of interest to

traffic men, this also depicted operations within this store's new warehouse building, where internal deliveries are streamlined for maximum efficiency.

#### MACK DIESEL

(CONTINUED FROM PAGE 38)

jection equipment consists of a flange-mounted Bosch multiple-unit injection pump with an integral governor on one end and pintle-type nozzles.

Seven main bearings of the precision thin-shell type with copper lead lining support the 147-lb. pack-carburized and case-hardened crankshaft which is fully counterbalanced with twelve counterweights forged integral. Crankpins are of large size and bored out for lightness and better cooling of connecting rod bearings. By using a 35-deg. cap angle, the connecting rods have been adapted to be withdrawn through the cylinders without disturbing the main bearings. Like the crankshaft, the camshaft runs in seven large bearings.

All lubrication passages are rifle-drilled out of the solid iron, no tubes or piping of any kind being used. Oil is fed under fixed pressure to all main and camshaft bearings, the connecting rods, valve rocker shafts, air compressor and governor and is effectively cooled by the full-length water jackets and the flat top of the crankcase, at the bottom of the jacket. The oil filter is built onto the crankcase and uses no external connections.

Aside from the water pump, fan, and generator, which are driven by the conventional triangular double V-belt, all timing and accessory drive is through a train of helical gears which are upset, end-grain drop-forgings, case-hardened and generator ground.

Mack's cold-circulation thermostatic system of temperature control is used in connection with a thermostat and directed water flow.

#### BODY OF THE MONTH

(CONTINUED FROM PAGE 31)

distance runs in the neighborhood of a million and a quarter miles, even a fraction of a cent saving mounts to a considerable sum.

The reduction in weight makes the truck handle like a passenger car. The weight reduction is accompanied by an economy in tire size. This truck is equipped with 6.00/20 tires in place of 7.50/20 tires which were required on previous models.

Little Falls laundry boxes are 15 in. in width. This body accommodates five rows across. Stationary slots prevent boxes from sliding fore and aft. There is a dry-cleaning compartment shield behind the driver to prevent wind or rain damage should the door be left open.

**DEMAND THE  
A-S-F Safety  
FIFTH WHEEL  
WHEN YOU WRITE  
SPECIFICATIONS FOR  
TRACTORS OR  
TRAILERS!**

A cartoon illustration shows two men in an office setting. One man, wearing glasses and a suit, is seated at a desk, looking down at a large blueprint or drawing of a vehicle. The other man, also in a suit, stands behind him, gesturing towards the drawing. A telephone is on the desk between them. Above the illustration, a large headline reads "DEMAND THE A-S-F Safety FIFTH WHEEL WHEN YOU WRITE SPECIFICATIONS FOR TRACTORS OR TRAILERS!" Below the illustration, the company name and address are printed.

**A-S-F FIFTH WHEEL**  
**AMERICAN STEEL FOUNDRIES**  
EAST CHICAGO . . . INDIANA

## LEGISLATIVE LOOKOUT

(Continued from Page 17)

### Federal

S.118 would establish a Highway Planning Commission to study (1) a four-lane through highway from New York to Washington, and (2) three east-west and three north-south highways. (This is the same as S.679 in the last Congress and is indicative of several super-highway plans prevalent in Washington.)

S.210 would amend the Interstate Commerce Act to regulate freight forwarders. The bill denies forwarders the status of common carriers but places them under ICC regulation as far as their transactions with customers are concerned. Forwarders are forbidden to enter joint rate arrangements with common carriers, but are restricted to use common carrier services exclusively and to pay the published rates of such carriers.

H.R.2086 would regulate interstate and foreign commerce in feeds, grains, bedding and other material containing noxious weed seeds.

H.R.2083 would provide for the construction of a memorial highway between the Lincoln Memorial in Washington, D. C., and the battlefield at Gettysburg, Pa.

### Arizona

H.13 and S.15 would increase sales tax to 2 per cent for all types of business including transportation service.

H.20 and S.19 would repeal the sales tax.

### Arkansas

H.16 would levy a tax on itinerant merchants and requires public liability and property damage insurance.

### California

Governor Olson stated that interstate barriers hamper movement of the state's agricultural products and that the State Commission of Interstate Cooperation should be empowered to help solve the problem.

S.3 would define "unladen weight" and amends weight fees for commercial vehicles to apply to vehicles weighing 3800 lb. unladen instead of 3000 lb.

H.31 would create committee of five to investigate cost of construction and maintenance of highways.

H.227 would impose compulsory motor vehicle insurance.

H.293 would eliminate the 3 per cent tax on commercial motor vehicles and levy combined weight and mileage tax.

H.317 would require that all new vehicles be tested for the escape of fumes.

H.323 would also provide a compulsory insurance system.

S.217 would provide a penalty for backfiring muffler on a motor vehicle.

### Colorado

H.99 would license and regulate the caravaning of motor vehicles.

H.27 would prohibit the transportation of petroleum products on the state highways on Sundays and holidays.

H.98 would regulate the transportation of live stock by motor vehicles.

H.35 would license motor vehicle mechanics and repairmen.

H.164 would place Interstate common carriers within the Workman's Compensation Law.

H.153 would provide for grading of motor fuels.

H.207 would define "carrying capacity" in relation to truck fees.

H.195 would authorize steam railroads to operate motor vehicles.

H.197 would prohibit the carrying of automobiles on vehicles with more than one level.

H.178 would also license and regulate motor vehicle mechanics.

H.233 would amend regulation of motor carriers (details not available).

H.289 would amend the length and weight of motor vehicles.

H.28 would limit the transportation of motor fuels on the highways to 2000 gallons per vehicle.

H.803 would provide for a compulsory insurance system.

H.459 would prohibit railroads from operating motor vehicles.

H.553 would prohibit the operation of trucks on Sundays and holidays.

H.916 would provide a regulatory law for new carriers.

S.10, S.13 and S.23 would regulate the transportation of live stock by motor vehicle.

S.149 would provide a uniform bill of lading law.

S.731 would tax and regulate itinerant merchants.

S.400 would tax and regulate caravans of vehicles and prohibit caravans under certain conditions.

S.539 would impose taxes on liquefied gases and transportation thereof.

S.527 would authorize railroads to operate motor vehicles.

### Idaho

H.C.R.2 would create a joint committee to investigate the cause of price fluctuations of motor fuel in Idaho, and the difference between prices in other states.

(Turn to Page 131, Please)



## IN THE SERVICE OF THE U. S. NAVY and ARMY for 31 YEARS

Continuously, since 1909, the U. S. Navy and Army and many government departments have selected Hollingshead products for their requirements.

Hollingshead chemists are working in close collaboration with our government to produce many of the secret and vital formulas necessary in the operation of America's armed land and sea forces.

"WHIZ" identifies products supreme in quality. Let the name "WHIZ" be your buying guide to lower fleet maintenance costs.



## CAR BEAUTY and MAINTENANCE PRODUCTS

POLISHES • CLEANERS • TOP DRESSINGS • TIRE COATING  
RADIATOR SPECIALTIES • BRAKE FLUIDS • ENAMELS  
SHOCK ABSORBER FLUIDS • GASKET CEMENTS • SOAPS  
ABRASIVE COMPOUNDS • SPECIALIZED LUBRICANT

**ARMY SAYS "OK"**  
(CONTINUED FROM PAGE 26)

changes in present manufacturing and design methods as is possible, to assure proper maintenance of the vehicles.

Under the National Defense Program the public interest requires as much standardization as possible and full cooperation with every industry. As a result, we now must limit the number of types and models of motor vehicles to the minimum consis-

tent with sources of supply, mass production, interchangeability and cost.

That, briefly, is the over-all program of the Army with regard to motor transportation.

Our military motorization policy is definite but it remains flexible—flexible to the extent that, although we need a few more than 250,000 vehicles for an army of a million and a quarter men, we are buying them gradually, to make them available only as rapidly as the divisions and

other troop units spring into being. This is being done chiefly to lighten the load on the automotive industry and to interfere as little as possible with its regular commercial program.

Today we have about 40,000 motor vehicles in service. By March, we expect to have around 140,000 and by the end of the present fiscal year, about 190,000. This will represent an increase of almost 17 times the number of vehicles in service four years ago. In April, 1917, the Army owned a few more than 3000 trucks and 437 automobiles.

In addition to that last figure of 190,000 for the end of the fiscal year, there will remain about 60,000 more vehicles to be delivered during the late summer or early fall, which will bring the total Quartermaster Corps Fleet to some 250,000.

These 250,000 motor vehicles will be divided, approximately, as follows:

Motorcycles	27,000
Bantam Car (1/4-ton truck)	4,500
Passenger cars	5,900
Ambulances	3,400
1/2-ton trucks (pick-up and reconnaissance)	69,000
1 1/2-ton trucks	44,000
2 1/2-ton trucks	58,000
4-ton trucks	3,800
6-ton and heavier trucks	3,800
2 1/2-ton truck-tractor with one trailer each	37,800

You may be interested in learning the uses planned for these trucks:

1/4-ton Bantam car 4x4 (four-wheel vehicle with four-wheel drive)—light weapon carriers for the infantry.

1/2-ton, 4x4—with bodies of various types, including command, reconnaissance, pickups, infantry weapon carrier, cross country ambulances and panel delivery trucks to perform a multitude of duties.

1 1/2-ton trucks, 4x4—a general purpose truck and a prime mover for 75 mm. field guns.

2 1/2-ton truck, 6x6 (six-wheel vehicle with six-wheel drive) a general purpose vehicle, prime mover for the 75 mm. field gun, and the 105 mm. howitzer, gasoline tanks and combination cargo and animal carrier.

4-ton truck, 6x6—used for towing 155 mm. howitzers and by the

(TURN TO PAGE 86, PLEASE)



**WILLIAMS' COMBINATION ELECTRICAL SET NO. 1291-P**  
(21 pieces)

Mechanics who formerly detested those mean electrical jobs now say 1291P gives 'em exactly what it takes!

Here's the "why" behind this small but sturdy set. The 10 Midget "Superrenches" each have 2 identical sized openings BUT AT DIFFERENT ANGLES. Where one head can't function—the other will. Another plus is the stepped-up working speed the 8 straight wall Midget "Supersockets" provide in close quarters.

Parts include 4 1/2" Sliding T Handle, Extension-Driver with revolving, lockable grip, Midget "Superplier." For ignition work, generators, wiring connections, carburetors, radios, etc. "Supersockets"—1/4" square drive.

J. H. WILLIAMS & CO.  
"The Wrench People"  
225 Lafayette St., New York, N. Y.  
Western Warehouse & Sales Office: Chicago.  
Works: Buffalo.

**WILLIAMS**  
SUPERIOR DROP-FORGED TOOLS  
SUPERSOCKETS • SUPERRENCHES

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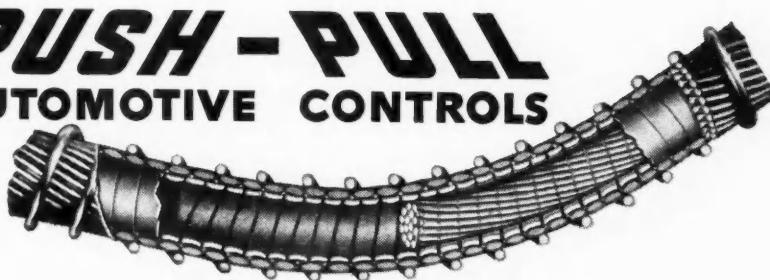
COMMERCIAL CAR JOURNAL  
FEBRUARY, 1941

**HE'LL DO!**



- You can't help loving the stocky, long-barrelled "Scotty" for his definite character. • The characteristics of TRU-LAY PUSH-PULL CONTROLS stand out so distinctly that they, too, are recognized as a type all their own. • Because their sealed-in lubricants can not get out—nor can grit or water get in—they promise a long life of smooth, free-acting, positive control. • Call on us to show you how easily you can adapt TRU-LAY PUSH-PULL to all remote controls.

## **PUSH - PULL AUTOMOTIVE CONTROLS**



**AMERICAN CABLE DIVISION**

12-252 General Motors Bldg., Detroit, Michigan • San Francisco: 630 Third Street



**AMERICAN CHAIN & CABLE COMPANY, Inc.**

(CONTINUED FROM PAGE 84)  
Engineer Corps as a general purpose vehicle.

6-ton, 6x6—this is the prime mover for the 3-inch and the 90 mm. anti-aircraft gun mounts.

4-5-ton truck, 4x4 — tractor trucks for towing semi-trailers, such as fueling units and oil servicing trucks for the Air Corps.

5-6-ton trucks, 4x4 — tractor trucks for semi-trailer mounted pontoons, and semi-trailers for various bulky loads, such as the

Corps of Engineers topographical units.

All of these vehicles require certain specific military characteristics. Among these are: maximum ground clearance, careful balance between gross weight and tire contact area to provide flotation yet maintain traction, and high angles of approach and departure. To be considered satisfactory, vehicles should be able to climb a grade of 40 to 50 degrees and to make a departure ranging from 30 to 45 degrees.

The Army has tested and used many makes and types of motor vehicles, including the full-track or track-laying type, the half-track and the wheeled types. The slow-moving and ponderous types of trucks used to serve our purposes but not now. We must move faster to be sure of "getting there fustest with the mostest men." Our trucks must travel 40 or 50 miles an hour or faster by day, and at 15 or 20 miles per hour at night without lights.

And we can no longer remain on hard surfaced roads. We must often leave good roads and get our men, our guns, and the food and ammunition they consume, through woods which give us protection against enemy air observation, into valleys and over mountains, across and up and down stream beds—in fact our trucks must be able to go wherever our combat troops and artillery may be located.

The all-wheel drive principle has proven to be most desirable for army vehicles which must travel under such conditions, and it has been adopted as standard by most of the great armies of the world. Originally used only on the larger trucks, the field of the four-wheel drive has been progressively widened. In 1938, we started using all-wheel drive on part of the 1/2-ton trucks and we have gone all the way in 1940 with all tactical equipment. In every case the result of the all-wheel drive has been performance far surpassing the expectation of the engineers.

The present War Department policy for the procurement of motor vehicles is to limit acquisition to models in commercial production by two or more competing organizations, and available at reasonable prices. Any deviation required from standard models is held to a minimum to meet the essential military needs. The parts which make up unit assemblies have in many cases been standardized throughout the industry as a result of the activity of the S.A.E., and are procured as standard material for both new vehicles and replacement or maintenance purposes.

Some military requirements for motor vehicles force a departure from commercial standards. Among these are: adjustable windshields, radiator and headlight brush guards,

(TURN TO PAGE 88, PLEASE)

**I make lots of Stops!  
Give me an Air Brake  
with PLENTY of  
RESERVE POWER!**



## **HE NEEDS MIDLAND The Air Brake Equipment with BIG 7.3 cu. ft. COMPRESSOR**



*'AIR:* Showing the 7.3 C.F. Compressor, fully compensating foot control valve and diaphragm chamber contained in Midland Air Brake Kits

Equip your fleet with the Air Brake that's *Super-powered!* Midland's 7.3 c.f. compressor practically doubles the air capacity usually furnished. Also get Midland's fully compensating control valve that releases any desired air pressure without "fanning" the pedal. Your choice of either cylinders or diaphragms. Complete KITS — both air and vacuum — with every nut, bolt and screw needed, available for popular trucks. Ask your nearest Midland Distributor — or write us direct.

**THE MIDLAND STEEL PRODUCTS CO.**  
10605 Madison Ave. • Cleveland, Ohio  
Export Dept. — 38 Pearl Street, New York City

**Those who KNOW power brakes—choose MIDLAND**



**MIDLAND**  
(CHRISTENSEN)  
*Power Brakes*





→ KEEP IT CLEAN WITH PUROLATOR ←

You'd fire the man who would put dirty oil in your crankcase. Yet in actual service, oil gets dirty quickly—unless the oil filter is on the job, trapping the dirt in the filter element. ★★ When oil shows dirty on the dip-stick, it's a signal to replace the filter element at once. It's like changing the blade in your razor. Of course, be sure you get genuine Purolator elements. The cost is small—the performance unparalleled! ★★ Insist on Purolator—standard equipment on the great majority of filter-equipped engines. Purolator Products, Inc. (formerly Motor Improvements, Inc.), Newark, New Jersey . . . *Founders of the oil filter industry.*

(CONTINUED FROM PAGE 86)

blackout lighting equipment, towing hooks and pintles, military type front and rear fenders, series-parallel switches, special spare tire and gasoline tank mountings and other special features such as the high angles of approach and departure mentioned before.

These modifications have not seriously hampered the manufacture of our vehicles nor materially delayed production. The chief modifications which must be applied to commercial

vehicles designed to meet our requirements have been those needed to provide them with cross-country mobility. The principal modifications are the front driving axles and transfer cases.

In procuring its vehicles, the Army has not lost sight of the status of the general truck transportation problem. We are constantly faced with the necessity of finding the best compromise between the employment of existing facilities, standard assemblies and the like, and the desirability

of designing and building *ideal* military transportation.

There is no doubt that the *ideal* military vehicle would require special designs, but we believe that it is undesirable to make demands that are too rigid, or changes from standard commercial practice which are too drastic. In this way we can avoid the prolonged delays in production and delivery which special designs necessitate because of the new dies, jigs, tools and fixtures they always require.

When vehicles have been delivered, a large part of the industry's work is finished while the Army's real job has just begun. That is to use the vehicles with the utmost effectiveness and to maintain them in a satisfactory running condition. In accomplishing this, we again look to the industry for parts and it is in this work that a tight policy of standardization and interchangeability comes into its own. Another problem thus arises, the importance of which cannot be overemphasized—the smooth functioning of a system of supplying necessary replacement parts to assure adequate field maintenance.

A motor vehicle for military use must be available for instant operation. A truck drawn up along the side of the road without fuel is of no transport value to the Army, neither is one that cannot run because it needs a part replaced. This means that the Maintenance task of the Quartermaster Corps is a particularly important one, in the fulfillment of which we will greatly need your cooperation.

Standardization work for Army use has been going forward rapidly and we have already arrived at some fairly definite policies concerning it. Some of these have already been mentioned briefly, but it may be well to review them.

For general purpose tactical vehicles, standard chassis types are being purchased— $\frac{1}{2}$ -ton,  $1\frac{1}{2}$ -ton,  $2\frac{1}{2}$ -ton, 4-ton and 6-ton. Body types are reduced to a minimum and are, to the greatest possible extent, interchangeable for any one chassis type. All tactical motor transportation equipment is of all-wheel drive type.

With the exception of passenger cars and motorcycles, all tactical vehicles have truck chassis. Motor truck features such as military bodies, all-

(TURN TO PAGE 90, PLEASE)

# Safety Lighting

## FRONT SIDES

## BACK

## IT'S DO-RAY ALL THE WAY...

**STREAMLINER CLEARANCE LAMPS**  
3 in line-marker-clearance or fender lamp. Heavy gauge metal throughout. Set in rubber to fit curved or flat surfaces. Gives 50% more light with 50% less battery drain. List Price \$1.25 and \$1.50.



**FLUSH TYPE CLEARANCE LAMP**  
Extreme height  $1\frac{1}{2}$  inches. Overall diameter  $4\frac{1}{4}$  inches. Steel construction. Specially designed one piece lens provides maximum light with only  $1\frac{1}{2}$  C.P., 5 volt bulb. Available in red, green, amber and white. List Price..... 55c



**GIANT LITE—with Angle Bracket**  
The 4 bolts in lamp and 4 holes in bracket are evenly spaced to permit 4 different mounting positions. Bracket and lamp of heavy gauge steel. Will withstand severe vibration. Dust and water proof. Complete with 32 C. P. Bulb. List Price..... \$4.00



**NOBBY REFLEX SIGNAL**  
For trucks, busses and trailers. Heavy metal frame. Black enamel finish. One piece moulded lens thoroughly protected. Passes all S.A.E. and E.I.S. tests. Available in red, green, amber and white. List Price..... \$1.00



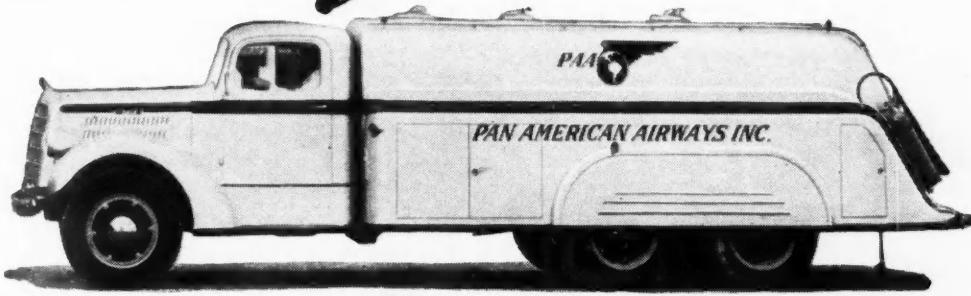
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LAMP COMPANY  
1458 S. MICHIGAN AVE. • CHICAGO  
SAFETY LIGHTING AND REFLECTING EQUIPMENT

**DO-RAY PRODUCTS**  
Tested by  
RECOGNIZED TESTING  
LABORATORIES  
PASSING SPECIFICATIONS OF  
S.A.E. AND E.I.S.  
MEETING REQUIREMENTS  
OF  
I.C.C.

SAFER LIGHT  
SAFER SIGHT

*Before you buy  
new equipment*



**MEASURE THE MERIT  
OF "6-WHEELERS"**

- For jobs like furnishing high-test gasoline to airports, moving heavy loads city to city, handling fragile, perishable merchandise, and for tough, off-road hauling, "6-Wheelers" are cutting costs, eliminating delays. Today's better-than-ever trucks, with Timken 6-Wheel Tandem Drive Axle Units, can save you money. You owe it to yourself to measure their merit.
- Factory-installed • Undivided responsibility
- Weight better distributed for bigger pay-loads • Longer tire and brake life • Smoother riding • "Hug" the road • Better traction off-road • Greater safety • Sizes and types with final drive ratios to "fit the job" and bring out the best in the truck.

Before you buy new equipment, measure the merit of "6-Wheelers." They're tops.

**THE TIMKEN-DETROIT AXLE CO., DETROIT, MICHIGAN  
WISCONSIN AXLE DIVISION, OSHKOSH, WISCONSIN**

**when you buy, specify  
TIMKEN**

**FACTORY-INSTALLED TANDEM AXLE UNITS**

(CONTINUED FROM PAGE 88)  
wheel driving axles, and similar items, are built according to Army specifications.

The highest aim of standardization is, of course, the greatest degree of interchangeability. In addition to the vehicles themselves and the spare parts used in repairing them, standardization also extends to the tools and equipment used in our repair shops.

While on the subject of standardization and interchangeability, the

Quartermaster Corps appreciates the most excellent work which has been done during the past seven months by the S.A.E. Advisory Committee, working with the QMC, which is resulting in an increasingly high degree of interchangeability of parts throughout the fleet.

The Advisory Committee has done a fine job although there is still much to do. Among other things: it has shown us how we can reduce the number of our storage batteries from 29 to five; spark plugs and generat-

ors from eight to two; gas tank patterns from eight to four; condensers and speedometers from six to one; fan belts from 21 to three; door handles from eight to one; and a host of others of equal importance to the field supply and maintenance program of the Army. Alone, these developments may appear to be small but, taken as a whole, they become very important.

We are ever on the alert to discover new short cuts in motor maintenance, whether it is by increased standardization or any other method, and we learn something new every day as we progress in our program. We in the Army know, however, that it is only through wholehearted cooperation between us and the automotive industry that the desired results can be achieved. We appreciate and value highly the time devoted to the subject of National Defense Program but, most of all, let us have the best motor transportation system the world has ever seen.

The above is excerpted from a paper, entitled "Motor Transportation in the National Defense Program," presented at the SAE Annual Meeting in Detroit, Jan. 7.

## ICC SAYS "NO"

(CONTINUED FROM PAGE 27)

diction in the case, the commission's report then went on to enumerate and explain its objections to the proceedings. First and perhaps foremost of these objections was the financial structure of the merger plan.

Transport Co. contended that the books of the respective companies did not correctly reflect their past earnings and present worth. Hence it undertook to have the equipment and real estate of the various companies appraised. Value of the equipment was raised from its book value of \$10,321,269 to \$11,157,502, an increase of eight per cent. Land value was raised from \$557,252 to \$745,983, an increase of 34 per cent, and improvements thereon were raised from \$1,577,967 to \$1,935,544, an increase of 23 per cent. Likewise the income statements of the respective companies were increased by approximately 28 per cent. All this the commission did not like and said so in a statement which bluntly declared that "it is not believed that a sufficient basis has been established to warrant a conclusion

(TURN TO PAGE 92, PLEASE)



**REDUCING** operating cost is the best way to increase trucking profit. That's where six-wheeler trucks offer plenty of gravy. As compared with four-wheel trucks, six-wheelers can carry practically twice as much payload under the laws of most states.

Compared with tractor semi-trailers, six-wheelers carry from 500 to 2500 pounds less dead weight. It is conservatively estimated that every pound of dead weight costs operators about a dollar per year.

And when it comes to insurance costs, six-wheelers receive much lower rates than tractor semi-trailers for liability and property damage insurance.

There are other advantages that are paying extra dividends to owners of six-wheelers. Let us tell you how you can move more payload per dollar with Trucktor-ed Six-Wheelers.

**THE TRUCKTOR CORPORATION**  
156 Wilson Avenue Newark, N. J.

**Trucktor**

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COMMERCIAL CAR JOURNAL  
FEBRUARY, 1941

# Both have MARGIN of SAFETY for EMERGENCIES

Fire hose must not fail, nor must brake lining.

To make fire hose safe, it is tested to withstand a pressure 260% greater than the regular, working pressure.

Yet Raybestos Heavy Duty Brake Lining provides even greater safety. It is tested to give safe stops with four times the rated load of the truck for which it is recommended. That's 300% margin of safety. That's stopping power!

You can have this extra brake safety for every vehicle in your fleet. The Raybestos Truck Recommendation Guide shows you how. It's free. Write

for it on your letter-head—now.



**THE RAYBESTOS DIVISION**  
of Raybestos-Manhattan, Inc.  
**BRIDGEPORT, CONN.**

BRAKE LINING, CLUTCH FACINGS, FAN BELTS,  
HOSE • FOR CARS, TRUCKS, BUSES, TRACTORS

**Raybestos**  
AMERICA'S BIGGEST SELLING  
**BRAKE LINING**

**"YOUR 2 BEST FRIENDS for HIGHWAY SAFETY"**

(CONTINUED FROM PAGE 90) that the land and improvements have, since their acquisition, appreciated in value by 34 and 23 per cent, respectively." There was similar argument with respect to the earning statements which were adjusted by reductions in depreciation, inventory and various expenses.

This reasoning was further amplified at the end of the report. In summing up its investigation of the overall financial structure the commission found that the total consideration to

be paid the carriers involved was 2.12 times the tangible property valuation indicated, 11.27 times the aggregate book net income for 1939, and 8.81 times the adjusted net income for that year. It was 24.62 times average net income for the years 1937, 1938 and 1939.

The commission then pointed out that "the restraining influence of a person spending his own money was not present." A large part of the transaction, it will be recalled, was to be paid for in cash by funds

raised from the sale of stock in Transport Co. "The higher the prices paid to sellers," the commission continued, "the greater the profit to all concerned—except the purchasers of the securities of the new company. It is our opinion that, in the aggregate, the prices agreed to be paid by applicant are excessive."

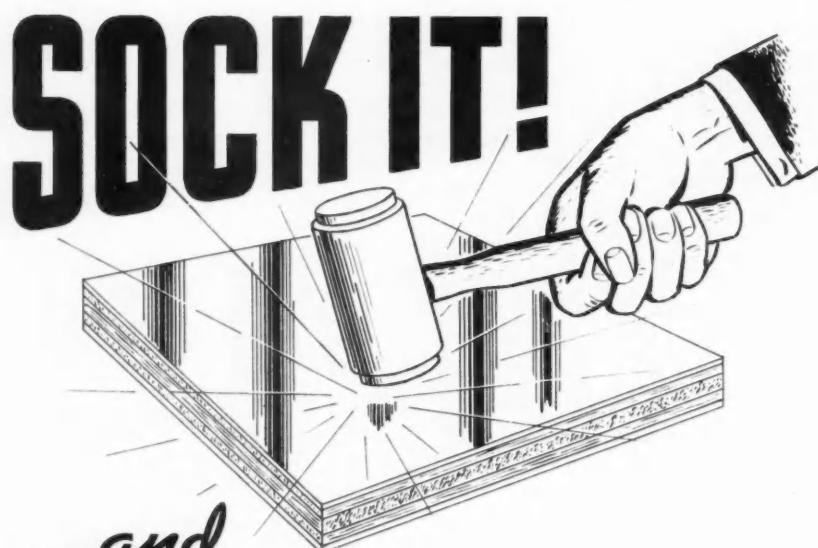
Next the ICC focused its attention on that part of the application which stated that the merger would be "in the public interest" and that better service would result, especially with regard to increased load factor, adequate capital, less congestion on the highways, faster service, etc. "In the absence of evidence that similar consolidations or expansions of operations on such a large scale have produced the results anticipated by the applicant," said the ICC, the testimony with respect to proposed economies and improvement of service is not convincing."

Still within the realm of "the public interest," the commission scored a direct hit on the proposal to include truck rental companies within the merger on the grounds that "it would place applicant in a position to obtain common-carrier business from large shippers through concessions in the rates charged them for rental of trucks." And there was an extra salvo aimed at the practice of leasing trucks to shippers as a means of cutting established tariffs.

When the commission learned that six of the companies were either established as contract carriers or had applications pending for contract carrier operations, it had only to cite Section 210 of the Motor Carrier Act which specifically prohibits (unless good cause can be found) any one company from holding both common and contract carrier certificates. Said the commission, in effect, "no such cause was found."

Several pages of the report then dealt with the subject of the effect of the proposed merger on competition. While the examiner had found that no undue restraint of competition would result two common carriers and the Traffic Bureau of the Lynchburg Chamber of Commerce had strenuously objected. So the commission studied the matter by zones, analyzing the number of carriers, Class I and otherwise, which constituted the competition in each zone.

(TURN TO PAGE 94, PLEASE)



*...and*

## YOU'LL APPRECIATE THE ENORMOUS STRENGTH THAT MAKES POSSIBLE THE EXTREME LIGHT WEIGHT OF **PLYMETL**

A good sound blow with a rubber mallet on a piece of Haskelite Plymetl tells you quickly and dramatically why this is the ideal body material. Despite its remarkable light weight, there'll be no dent—no distortion of the smooth, flat surface. That's because the metal-to-plywood construction is stronger, weight for weight, than any other common body building material. The advantage, in

service, is tremendous resistance to the shock and vibration of day-in, day-out punishment on the route...less damage and easier repair in case of collision.

The extreme light weight of Plymetl is a direct attribute of its strength and rigidity, and shows up in body construction as greater payload capacity and lower operating costs. Lightness combined with strength means fewer and smaller framing members—and still less non-revenue-producing dead weight to haul around.

Add fast and easy fabrication and you see why we call Plymetl the perfect material for sides, roofs and doors—and ask that you call in Haskelite engineers on your next body job.

**HASKELITE PHEMALOID**—Large panels of hardwood plywood, phenolic resin bonded, for one-piece, dust-proof light weight floor construction.



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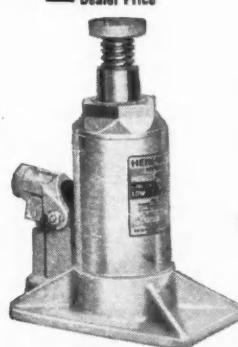
**NO TRUCK SHOULD BE WITHOUT ONE OF THESE  
SUPER-POWERFUL, EASY-OPERATING  
HEIN-WERNER HYDRAULIC JACKS**



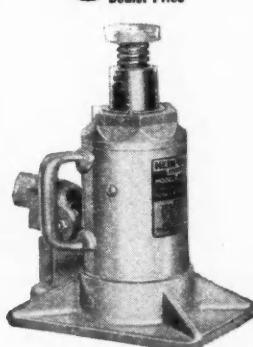
**1½ Tons**  
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Dealer Price



**5 Tons**  
**\$8 95**  
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**12 Tons**  
**\$17 50**  
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West Coast prices are slightly higher than those shown above

**SAVE TIME and MONEY by  
EQUIPPING YOUR FLEET NOW**

Thousands of truck operators know from experience that it pays to have a Hein-Werner Hydraulic Jack in the truck tool kit—ready for instant service.

The ease, speed and dependability of operating a H-W Jack cuts down on the time required to make tire changes on the road. And the ease and safety of operation makes a hit with the man who pumps the jack.

All H-W Truck Jacks are factory tested at 1 1/2 times their rated capacity. Each has leak-proof hydraulic unit, and large sled base.

Complete H-W line includes 1 1/2 ton capacity hydraulic jack at only \$2.80 . . . 2 ton model, \$2.95 . . . 3 ton model, \$6.95 . . . 5 ton, \$8.95 . . . 8 ton, \$11.75 . . . 12 ton, \$17.50 . . . 20 ton, \$30.00. (All prices are net to dealer, and slightly higher on West Coast).

Hein-Werner also makes Bumper-Lift Hydraulic Jacks for passenger cars, and a full line of Service Jacks of 1 1/4, 1 1/2, 2, 3 and 4 tons capacity. Also SAFE-T's (non-adjustable horses) of 5 and 10 tons capacity.

For details and latest prices, ask your H-W jobber, or write us  
**HEIN-WERNER MOTOR PARTS CORP.**  
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**HEIN-WERNER**  
*hydraulic* **JACKS**

(CONTINUED FROM PAGE 92)

The summation was the statement that "there would remain substantial motor carrier competition between most cities in the New England and Middle Atlantic regions, but we are left in doubt as to whether adequate motor carrier competition would remain on traffic moving between the southern region and points north of Baltimore."

In the original application all companies within the merger were to have retained separate corporate

identities. The result would have been two or more carriers, under common control, operating over identical routes with a peak of 16 such carriers between New York and Philadelphia. Such a plan had frequently been condemned by the ICC, so supplemental applications were filed by the applicant seeking to remove these doubtful features by effecting "a singleness of title" at some future date. But no definite plan for effectuating this part of the application was submitted and the commission said it could not give "carte blanche" authority for such a move.

Finally, although the commission said that it had no jurisdiction over the making of employment contracts by carriers it criticized the \$685,550 involved in employment contracts with key officers of the various concerns. Said the commission, "Such contracts should be considered in the same light as that of other obligations by the carrier, particularly when such contracts are entered into as a part of the unification plan. It is our opinion that the making of employment contracts to such an extent as made in this proceeding . . . is not in the best interest of the industry and the public."

Although he concurred with the major points of the decision Chairman Eastman offered a separate opinion in which he deplored the speed with which the decision had to be made and said that he should like to see the experiment tried. He said that he did not share the views of the other commissioners with respect to the effect of the merger on competition, nor with respect to the evils of unification through a holding company per se. He agreed that the plan should be considerably simplified by consolidation of a considerable number of the subsidiary companies. Hitting the financial structure, Chairman Eastman stated that this was the most objectionable feature and called attention to the fact that although the common stock had a par value of \$1 per share it would have to be marketed at \$20 per share in order to raise the necessary cash.

Commissioner Alldredge also issued a concurring opinion in which he said in part, "In my opinion there are two fundamental reasons for rejecting the proposed plan. The first is the financial transactions involved. The second is the resulting capitalization of the new company."

**DON'T STALL - DON'T SKID -**

**KEEP GOING WHEN OTHERS HAVE TO QUIT....**

**SCHOOL BUSES**

**WRECKING CARS**

**FARM TRUCKS**

**SLIPPERY GOING**

**INSTALL THE**

**THORNTON Automatic Locking DIFFERENTIAL**

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**TRACTION** when and where you need it — Keep Going when mud, sand, ice and snow stall trucks with only ordinary differentials.

Save gas, oil, tires, chains — Cut operating cost

Eliminates spinning of one drive wheel because both rear wheels must rotate when power is applied. Quickly installed in standard rear axle differential carrier without special tools.

Endorsed by truck and bus operators all over the U. S. A.

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8701-8779 GRINNELL AVE. DETROIT, MICH.  
Makers of THORNTON four-rear-wheel DRIVE for trucks  
"When you need TRACTION you need THORNTON"



The City of Coronado, Cal., recently put this Mack model EG garbage truck in service. The Gar Wood "Load Packer" body packs in a 12 cu. yd. load

# Don't build a truck of any kind

*... until you get the facts  
about U·S·S COR-TEN!*



BOTH to the user and builder of trucks and trailers, U·S·S COR-TEN construction offers important money-saving advantages. Here are a few—

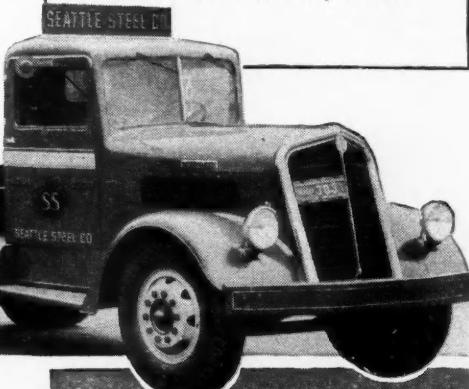
1. **COR-TEN construction is rugged.** COR-TEN is tough, strong and highly resistant to impact, vibration, wear and abrasion. Its yield point of 50,000 lbs. per sq. in. minimum—is 1½ times that of ordinary structural steel. Its deflection is about one-third that of non-ferrous "light" metals. That's why stress carrying members of COR-TEN do not have to be thick, rigid and durable.
2. **COR-TEN construction assures low maintenance.** In addition to its toughness and high strength, COR-TEN has 4 to 6 times greater resistance to atmospheric corrosion than plain steel. Parts subject to the attack of salt and brine, inseparable with winter operation, will last longer built of COR-TEN.
3. **COR-TEN fabricates and repairs easily.** Shop crews have no difficulties with COR-TEN because they are working with steel—a metal they are thoroughly familiar with. This is a point highly important to the operator who can't afford to take time out for factory repairs.
4. **COR-TEN saves weight at lowest cost!** COR-TEN will safely reduce weight in truck and trailer construction at an average cost of only a few cents per pound trimmed off—a fraction of the cost of reducing weight by the use of non-ferrous "light" metals.

Thousands of installations made in the six years since COR-TEN was introduced prove these facts. Even more important, they have demonstrated that it is no longer necessary to pay a high premium for light weight—for increased strength—or greater durability. You can get them all, together, at low cost with COR-TEN construction.

We will be glad to show you how easily and economically COR-TEN can be applied to your designs.



**COR-TEN HERE, ASSURES STRENGTH**  
and long life. Hard working steel trucks like these take quite a beating; that's why bodies are ruggedly built of U·S·S COR-TEN. Without increasing weight, COR-TEN gives ample strength to handle 25,000 lb. loads, provides high resistance to corrosion, to wear, abrasion and loading shocks. Body fabrication by Standard Equipment Company, Seattle. Truck by Kenworth Motor Truck Corporation.



## U·S·S HIGH TENSILE STEELS

AMERICAN STEEL & WIRE COMPANY, Cleveland, Chicago and New York  
CARNEGIE-ILLINOIS STEEL CORPORATION, Pittsburgh and Chicago  
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TENNESSEE COAL, IRON & RAILROAD COMPANY, Birmingham  
NATIONAL TUBE COMPANY, Pittsburgh  
United States Steel Export Company, New York  
Scully Steel Products Company, Chicago, Warehouse Distributors

UNITED  
STATES  
STEEL

## FLEET FODDER FROM SAE FORUM (CONTINUED FROM PAGE 21)

Inflated tires would be badly punished by the wider rims there was given the assurance that tests were run with tires 30 per cent under-inflated and 20 per cent over-loaded and no damage to cords showed up.

Truck tires were not mentioned in the formal presentations nor in the discussion. Refusing to view this as an indication that the idea of wider

rims had no heavy-duty implications, your reporter button-holed the tire experts individually at the end of the session and asked them for light. All of them admitted that the wider rims were being tested with truck tires. One said that the benefits were the same for truck tires as for passenger car tires, and even greater in some instances. We gathered that all tire companies are working on the problem right now and that dual spacings presented one of the difficulties that had to be overcome. We were cau-

tioned, however, to make no predictions and no promises, and reminded that national defense requirements might delay the development.

### Brakes

Brake equalization between truck-tractors and trailers was the subject of an illuminating paper by John W. Votyka, chief engineer of Fruehauf Trailer Co., and E. Vance Howe, of Bendix-Westinghouse Air Brake Co., and delivered by the former.

The authors pointed out that from the standpoint of operating efficiency tractor-semi-trailer combinations present three highly important considerations:

"First and primarily, a braking system which is adequate in design and capacity for the rated load of each individual vehicle unit.

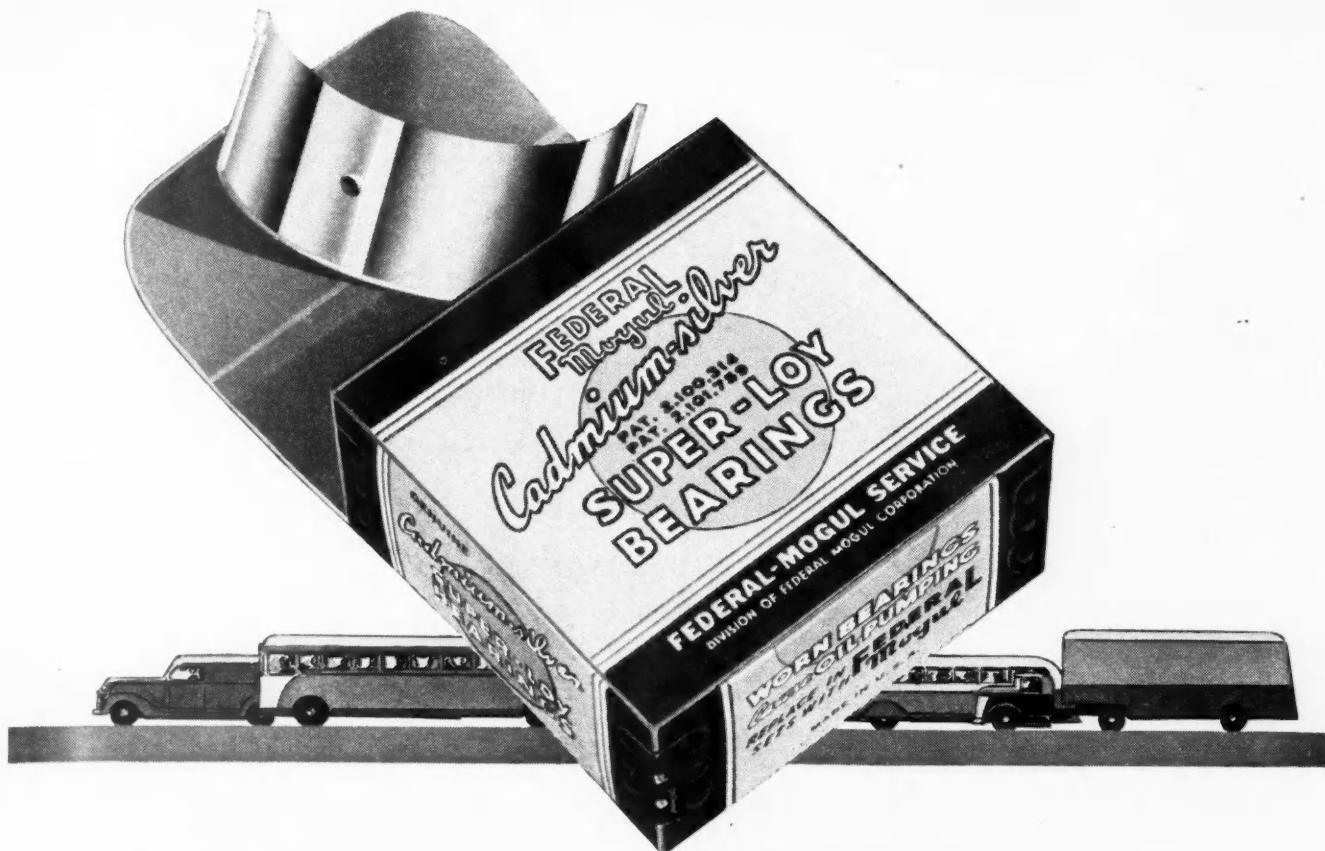
"Second, the proper adjustment and maintenance of the brakes of the entire train so that each bears its proper share of the braking load.

"Third, operation control so that concentration of the brake load is not too heavy upon any individual drum or axle in relation to the braking efforts on other units."

It is possible, they said, to have a train which is properly balanced and equalized throughout. However, "because of the tendency of the operator to apply the power brake system of the trailer for the major part of his braking requirements, through independent means, excessive concentration of braking is carried by the trailer axle and drums. Consequently, an adverse set of circumstances is set up which creates overheating and excessive wear." To overcome this the authors recommended the adoption by operators of a brake balancing program. The program was described in the October, 1940, issue of this publication. Wherever it has been followed it has, according to the authors, resulted in a material increase of brake lining life, substantial decrease in brake drum breakage and cracking, reduction of adjustments to 1500 and 2000-mile periods, reduced bearing failures due to heat, eliminated tire blowouts due to heat, and increased braking efficiency on all units.

Regarding brake control systems, the authors made a critical comparison of heavy and light-duty combinations:

(TURN TO PAGE 98, PLEASE)



## MILEAGE PER OVERHAUL INCREASED WITH SUPER-LOY

ACCURATE, comparative records show a Federal-Mogul Super-Loy bearings give more mileage per engine overhaul—enough more mileage to make these improved bearings an important contribution to increased efficiency and lower maintenance costs in heavy-duty

service. Wherever "tough" operating conditions are encountered; for the maintenance department with a crank-shaft problem to lick, and to satisfy demands for increased mileage—Federal-Mogul SUPER-LOY BEARINGS are the answer!

NATIONAL TRANSIT GAS and OIL CLINIC

(Bus Division: American Transit Association) • BOOK-CADILLAC HOTEL, DETROIT, MICH., FEB. 17-18

FEDERAL-MOGUL CORPORATION

DETROIT, MICHIGAN



ENGINE BEARINGS FOR EQUIPMENT—FOR SERVICE • ENGINEERED FOR OIL-CONTROL

(CONTINUED FROM PAGE 96)

"Most tractor-trailer combinations of the so-called heavy-duty class are usually factory-equipped with air-operated mechanical brakes with control mechanism properly engineered and installed in accordance with the manufacturers' recommendations to effect satisfactory synchronization of all brakes," they said. "However, in the light and medium duty class of tractor-trailer combinations, most brake control systems have been made in the field with little or no

thought given to the synchronization of either the power or time factor. The trailer control systems have, in many instances, been installed by brake service stations to suit the individual operator's whims or desires with a result that proper synchronization is not obtained and unsatisfactory braking and undue maintenance costs are bound to result."

To effect synchronization in such cases the authors "highly recommended" the use of an automatic hydraulic control valve "with all

tractor-trailer combinations where the tractor brakes are hydraulically actuated and the trailer is equipped with a vacuum system."

The use of hand levers that provide independent control of the trailer brakes was deplored. Sound solution of the braking problem is "a brake system where the control provides for simultaneous and power-synchronized application of trailer and tractor brakes."

The discussion that ensued centered criticism on the hand control lever.

"Hand control levers should be removed," declared Merrill C. Horine, of the Mack Company. "The rule around Chicago seems to be to have no other control but the lever control. The driver makes his stop with the trailer brake. This regardless of the fact that a stretched train can skid and skid badly if the road is slippery. The whole principle is very faulty. The only way to get maximum retardation is through simultaneous application on all wheels with the brakes balanced according to the load imposed on the various wheels."

Lt. Col. M. V. Brunson, of the Quartermaster Corps, hoped that the Army's future orders of combinations "will have hand control valves eliminated." He said that "on the last order of fifth-wheel jobs we got our ears pinned back by the manufacturers."

B. Frank Jones, of White, agreed that the hand control lever should be eliminated. And J. Willard Lord, safety engineer of Atlantic Refining Co., admitted that the hand lever was a makeshift but that "until we get proper synchronization of brakes we will have the makeshift."

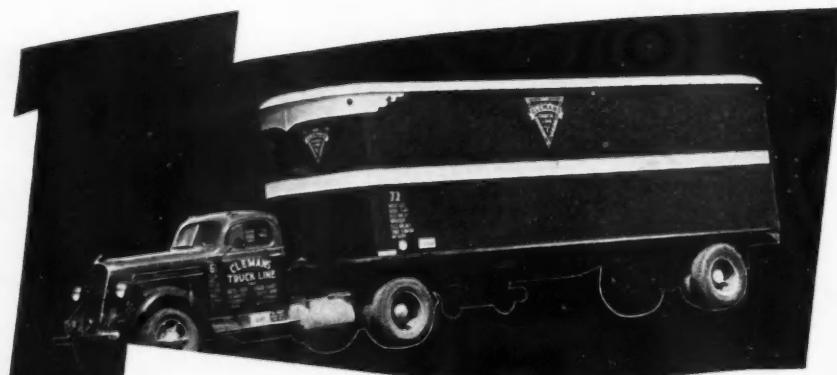
#### Lubrication

In one of the most critical papers on the subject of lubrication ever presented at a meeting of the Society, R. J. S. Pigott, staff engineer of Gulf Research & Development Co., aimed his constructive darts at engine design. He sketched the difficulties encountered with cadmium-silver bearings, with varnishing, with con rod bearings and camshaft bearings and blamed them largely on engine design that restricts the flow of oil and provides insufficient oil cooling.

He conceded that the flow of oil might be adequate for lubrication but

(TURN TO PAGE 100, PLEASE)

## BEFORE YOU BUY ANY TRAILER..



### -CHECK THEM ALL AGAINST EDWARDS WEIGHT-SAVING...

Want the deadweight of your next trailer cut so you can haul more payload? Edwards is a money-maker by that standard. As light in weight as is practical.

It's a money-saver when repairs are necessary, too. That's because Edwards sticks to tried and proved methods of trailer design. Saves much of the excess weight by fabricating from hi-tensile steel. Thus much lighter sections are used to carry the load imposed without any sacrifice in strength.

There are 25 other important money-saving features besides. Investigate Edwards values.

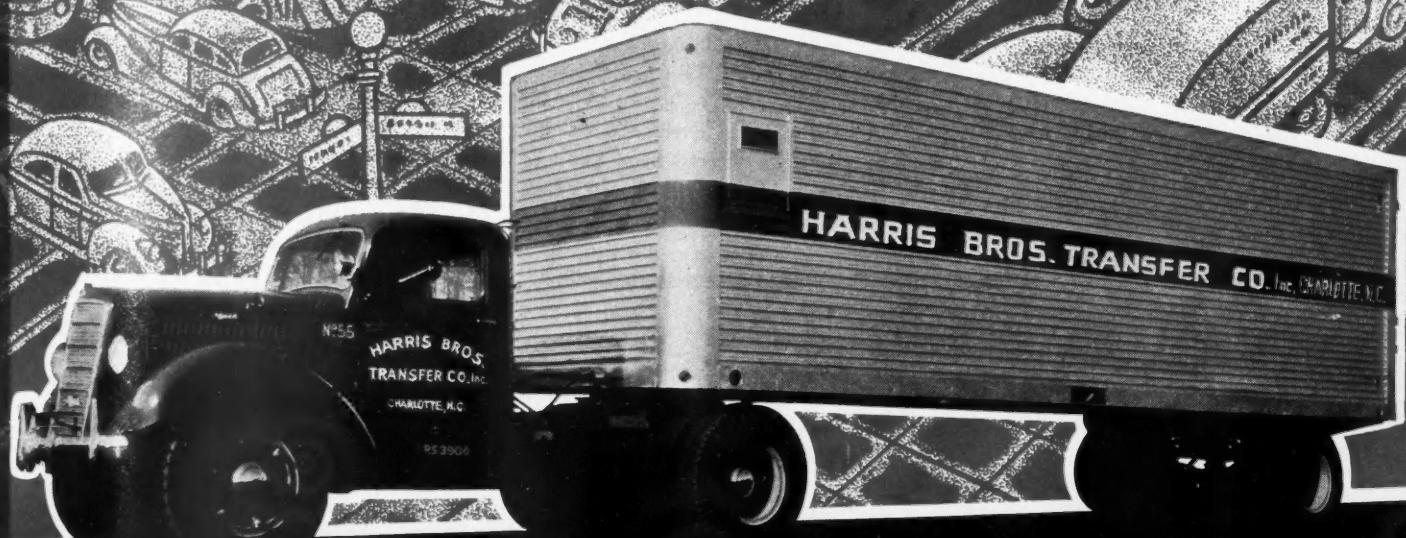
**EDWARDS**  
EDWARDS IRON WORKS, SOUTH BEND, IND.  
**HI-TENSILE STEEL  
SEMI-TRAILERS**

ATTRACTIVE PROPOSITION FOR QUALIFIED DEALERS. WRITE OR WIRE.

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COMMERCIAL CAR JOURNAL  
FEBRUARY, 1941

There's Plenty of Traffic  
Between the Carolinas and Boston



## HARRIS BROTHERS... a five year Thermoid user passes along this tip... "TRY THERMOID"

After five years' experience with Thermoid Brake Linings over the most heavily congested route that any carrier could face, the Harris Brothers Transfer Company is pretty well qualified to pass an opinion on the merits of brake linings.

When they were asked if they had any comment about Thermoid Linings that we could pass along, they said

..."Just tell them all...try Thermoid."

So Harris Brothers have said it for us

... "try Thermoid." They base this suggestion on the most practical test there is...actual operations...day after day...year after year.

We'd like to add only one further suggestion. When you try Thermoid... pick out your toughest unit and give Thermoid Products a real test.

# Thermoid

CUSTOM-BUILT BRAKE LINING SETS • CBB SETS  
THERMO-BLOCKS FOR HEAVIEST DUTY

\* THERMOID COMPANY \* Trenton, New Jersey \*

(CONTINUED FROM PAGE 98)  
contended that the flow was entirely insufficient to remove heat and keep the oil temperature and oil dwell low enough.

"Few seem to recognize," he said, "that increased output has resulted in a greater proportion of cooling being transferred from cooling water to oil. The increase of temperature, particularly in the crankcase, has made the situation very hard on oil. The chemists easily prove to us that an increase of 18 to 20 deg. F. doubles

the deterioration rate of any oil. Inhibitors do not alter this condition; they can only postpone the start of serious deterioration, thus lengthening the time before deterioration to an undesirable degree. If sound results are to be obtained, very serious attention must be given to lowering oil temperatures as much toward the lower limit—about 140 to 150—as possible."

Mr. Pigott then proceeded to cite engine designs that have been problem children so far as lubrication is

concerned. He did not pull his punches and his overflow audience revealed its agreement time and again with hearty applause.

Summing up, he said "the following conclusions appear reasonable:

"1. High crankcase temperature due to insufficient cooling, and still higher bearing temperature due to too small oil flow can be, and for future increased horsepower per cubic inch, will have to be, kept down. Unnecessary high temperature is the major factor in present lubrication troubles, and the hurried development of an army of special oils.

"2. Oiling systems can be and must be designed, not whittled. Drafting room or engineering department errors should not be corrected, as now, at the expense of the customer or of the oil company, after the design is in production.

"3. Increased cooling by oil will probably further increase, especially if piston cooling becomes general. If horsepower per cubic inch increases, as it will, external coolers should be used and the job can be done properly.

"4. Crankcases should be designed to drain clean; many of them retain up to 15 or 20 per cent of the full charge. This is bad for a new charge. It is well known that when fresh oil is added to oxidized oil, sludge and varnish may be precipitated, causing quick deposits thereafter. We have had this trouble for two or three years, especially when paraffinic type oils are added to badly oxidized naphthenic oils.

"5. The mania for very light oils and completely 'drying up' the engine should be reconsidered. The 'drying up' should stop before the top ring dries up and withers. The light oils make winter starting easier, but they are less stable than heavier grades, and the ultimate load-carrying capacity of the bearings is cut down until the danger zone is near operating loads."

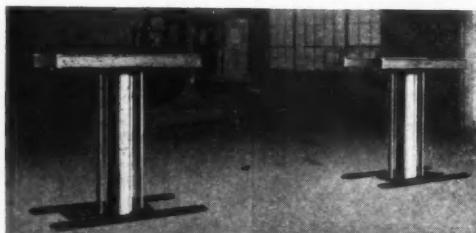
To meet some of the lubricating problems that have arisen the oil companies have developed compounded or, as Mr. Pigott put it, "prescription oils." The compounded oils, he said, are here to stay, "as even faulty designs, when they are on the market, must be kept running. These oils generally work in a particular engine, class of design, or ser-

(TURN TO PAGE 102, PLEASE)

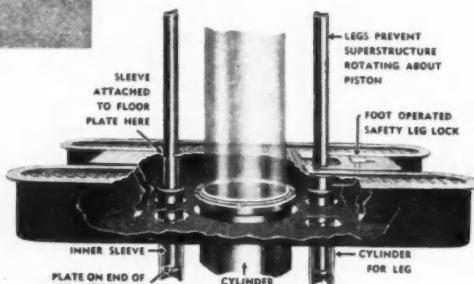


... and Joyce Lifts are necessary to keep your fleet of trucks in fighting shape.

Joyce Two-Post Lifts with split superstructure combine three factors very essential for satisfactory Truck maintenance operations.



*As superstructure is raised, legs attached to superstructure forming non-rotating device move upward, the plate on bottom of legs contacting floor sleeve and lifting checkered floor plates up to floor level. When Lift is lowered, floor plate drops to bottom of frame.*



plete underbody clearance; ample head and elbow room, and nothing to interfere with removing drive shafts, springs or wheels.

- (1) The short rails make it possible to spot trucks of various lengths over Lift without moving pistons or driver leaving cab.
- (2) When Lift is raised, corrugated steel floor plates automatically cover recess in floor occupied by superstructure when Lift is down.
- (3) Short rails engage axles in such a way that there is com-

*Further details and specifications are given in new Joyce Bulletin. Send for them today.*

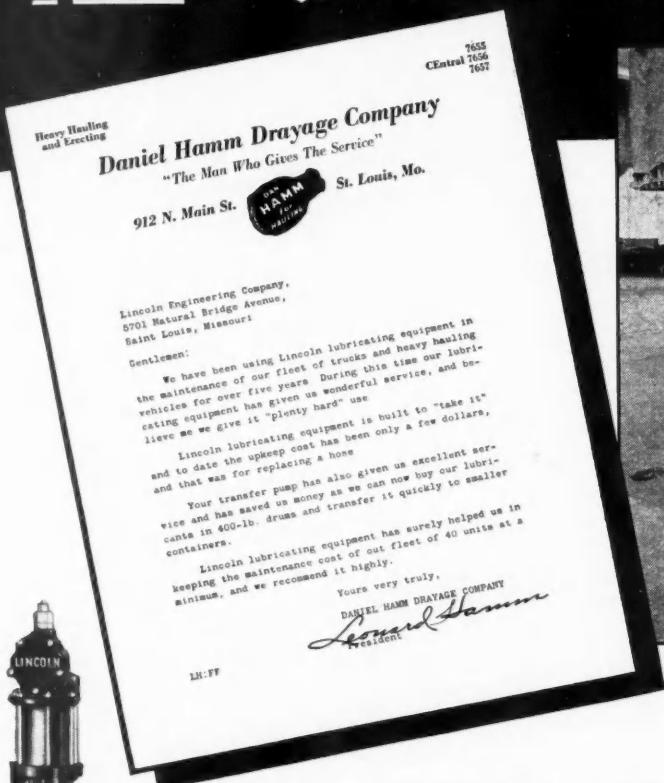
THE JOYCE-CRIDLAND CO., DAYTON, OHIO



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AIR POWER UNITS**

# "LINCOLN LUBRICATING EQUIPMENT IS BUILT TO "TAKE IT" . . .

in 5 years the upkeep cost has been only a few dollars"



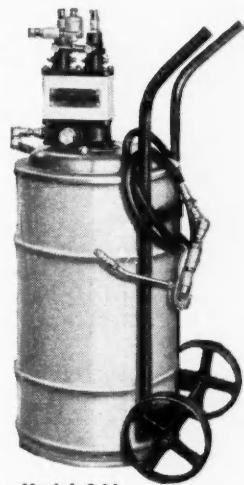
Model 1799  
(dispensing from original drum)

Five years ago the Daniel Hamm Drayage Company in St. Louis purchased Lincoln lubricating equipment, and this installation, like thousands of other Lincoln installations, has proved to be very dependable and economical.

Mr. Leonard Hamm writes: "Lincoln lubricating equipment is built to 'take it', and to date (after five years of service) the upkeep cost has been only a few dollars, and that was for replacing a hose . . . Your transfer pump has also given us excellent service and has saved us money as we can now buy our lubricant in 400-lb. drums and transfer it quickly to smaller containers."

Just as Lincoln equipment has helped the Daniel Hamm Drayage Company keep the maintenance cost of their fleet of 40 units at a minimum, you, too, can effect economies and speed up grease jobs by equipping your shop with Lincoln lubricating equipment.

Lincoln makes a full line of equipment for dispensing lubricants from 400-lb., 100-lb., 50-lb., and 25-lb. original containers, as well as a complete series of hand and air-operated one pound guns.



Model 346

Model 346 (shown above) is a portable 100-lb. size of the type used by Daniel Hamm Drayage Co. Model 1799 Airline Lubrigun (shown at left) is designed for dispensing lubricant direct from original 400-lb. drum. For details on these units, and all others in the complete line, consult your nearest Lincoln jobber—or write us.

## LINCOLN ENGINEERING COMPANY

Pioneer Builders of Engineered Lubricating Equipment

ST. LOUIS, MO., U. S. A.

(CONTINUED FROM PAGE 100)  
vice, much better than the earlier oils, but in no case of which we are aware do they fit all cases. For example, an oil with additives to suit one design of diesel engine may not be satisfactory in another design nor serve for heavy-duty gasoline engines. At the same time many diesels and many heavy duty gasoline engines are getting along perfectly well on high-grade straight mineral oils."

Based on experiments, Mr. Pigott had the following tips for fleetmen:

"With regard to fresh metal surfaces, the period just after overhaul is important. There has been a flock of troubles in fleet operation that are almost inevitably laid to oil. In addition to the fresh, rough surfaces of new rings and perhaps a honing job and new pistons, the engine is frequently cleaned with solvents that not only take off the deposits but the sealing lacquer originally put on to seal core sand particles. This stripping exposes much more clean metal than is present in a new engine, and the

deterioration rate of oil is increased.

"When a new engine is being broken in considerable colloidal iron is brought down which affects the oil rapidly. It would, therefore, seem sensible to change oil every 500 miles for the first 1000 and perhaps not over 1000 for the third change, in new engines.

"Another situation that comes up mainly after overhaul, and in most cases in fleet shops, is, there is undoubtedly some misalignment due to relaxation of casting strains, or cylinder distortion, occasionally some out-of-round in crankpins, and frequently the big end of the rod is out of shape. Most of this class of repairman fit bearings tight, as with babbitt; but copper lead should be given considerably more clearance. When the makers of copper lead bearings make clearance recommendations for an industrial bearing, it is always more than for babbitt and sometimes twice as much.

"Another practice which can give trouble after overhaul is that of line-reaming copper lead bearings. As received from the manufacturers the roughness as measured with the profilometer is 7 microns. After reaming it is frequently up to 200 microns. In addition to the mere roughness risk, this operation leaves the surface shell in fine shape for accelerated attack.

"Our experiments also show that the less copper in contact with oil the better. Substitution of all steel for copper tubing in the oil system of a test engine made a noticeable difference in the deterioration rate."

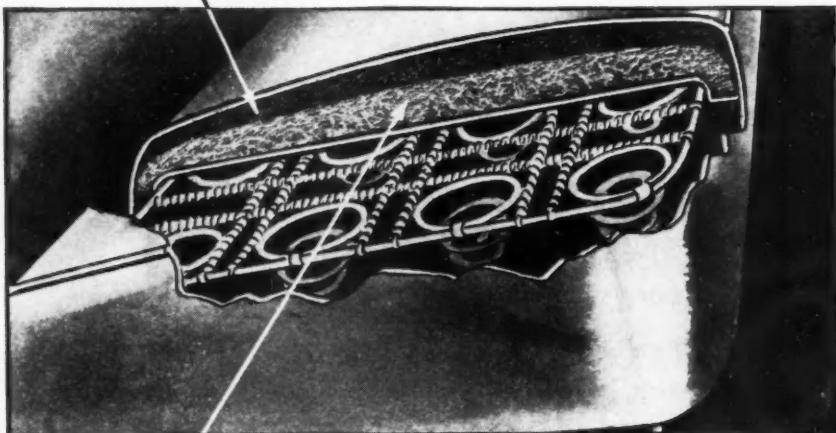
## Diesels

Diesel engines were well represented on the program. Lines along which progress will be made were sketched by Eugene H. Fezandie, of the Stevens Institute of Technology, and the solution of lubrication problems was covered by a group of engineers representing the research division of Standard Oil Development Co.

Mr. Fezandie reported that "progress is being steadily made to reduce the handicaps of the diesel." Simplification of design and weight saving have done much to reduce the price differential, he said, but considered it unlikely that costs of diesels and

(TURN TO PAGE 104, PLEASE)

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ATTACHED BY LATEX



HAIRFLEX CUSHION

thus preventing shifting and lumping. This is an original Armour feature.

So when you purchase your next trucks, consider these valuable advantages: HAIRFLEX is comfortable—it gives all-over support! . . . HAIRFLEX promotes safety—by reducing driver fatigue! . . . HAIRFLEX is economical. Its long life results in much less seat repair—less truck idle time. Instead, more hours of hauling! It won't shift, mat, or lump. When you buy, specify HAIRFLEX.

**Drivers sit IN, not on HAIRFLEX**

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## TOUGH .. BUT OH SO GENTLE

### TOUGH ON OIL-PUMPING ... GENTLE ON CYLINDER WALLS

● Hauling heavy loads over mountain roads is a test for stamina of men, motors and piston rings. Here's the experience of a fleet owner in New Mexico:

"These trucks average 1,900 miles weekly largely over mountain roads with average load of 12,000 lbs.

"Steel-Vents were installed to replace originals,

at 14,000 miles. They have just been changed after 66,663 miles of service . . . We miked the cylinders and they show three-thousandths out at the top (.003). We are installing Steel-Vents in all of our trucks."

For long life and economy play safe, standardize on Hastings Steel-Vent as do hundreds of fleet owners.

HASTINGS MANUFACTURING COMPANY, HASTINGS, MICHIGAN

*Piston Rings • Piston Expanders • Valv-Rings*

**HASTINGS**  
STEEL-VENT PISTON RINGS  
U. S. Patent Nos. 2,148,997 - 2,375,409

*Stop Oil-Pumping • Check Cylinder Wear*

(CONTINUED FROM PAGE 102)  
gasoline engines would be equalized because of the great difference in their fuel injection systems.

"Because of the remarkable strides in refinement of design," said Mr. Fezandie, "diesel weights are not now far out of line compared with gasoline engines of the heavy-duty services. It is to be expected that a small difference will exist as long as maximum pressures in the diesel are considerably above those of the gasoline engine. Weight reduction by

the use of lighter materials such as aluminum or of welded construction methods will undoubtedly be extended wherever economically practicable, but will affect the first cost."

Mr. Fezandie held increase in output per cubic inch of displacement to be a fertile field for weight saving and indicated supercharging and two-cycle design as the two general directions that seem practical.

Maintenance costs are being gradually reduced, he said. In the bus field maintenance costs lower than

for the gasoline engine are being reported.

"The gradual reduction in cost per horsepower which is continuing," Mr. Fezandie concluded, "should open up new fields of application."

In the discussion C. L. Cummins, president of the Cummins Engine Co., admitted that welded steel construction opens up new possibilities of weight reduction.

"We've got the gasoline engine makers on the run now," he said, "because we can do certain jobs better. Ten years from now things will have been done in diesels that will be amazing to all."

Another discusser remarked that "if we don't soon have better superchargers it will be a reflection upon our ability."

The Standard Oil research engineers stated flatly that oils improved by the use of various additives provide better lubrication and keep diesel engines in a better mechanical condition than conventional oils. Based on their experiments, they said, however, that "no blanket recommendation will provide optimum lubrication practice in all engines and in all services. What may be an excellent practice for one operator may not be satisfactory for another whose equipment, type of operation, etc., are all different. In general, the engine manufacturers' oil change schedules should be followed, and in no case should an additive blend be changed any less often than a conventional oil, until the operator has become quite familiar with the new product."

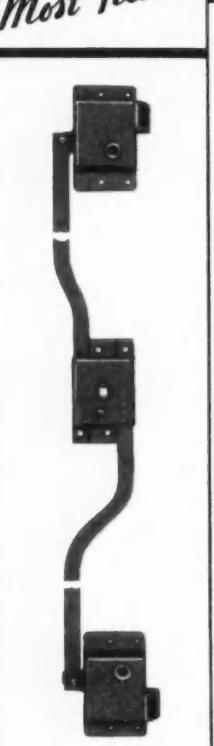
Until more laboratory and field experience is accumulated, the oil experts suggested that detergent-type oils should not be mixed with other oils, blended and unblended. Also, any engine changed over to a detergent blend should first be thoroughly flushed, and then, after running a nominal period on the new oil, the crankcase should be drained and recharged. Thereafter it should not require as much special attention. However, when engine deposits are being assimilated with difficulty by the blended oil, several oil changes may be necessary before the purging of the engine is completed.

"Filter replacement schedules based on the oil condition require revision when applied to lubricants containing

(TURN TO PAGE 106, PLEASE)

# (E) EBERHARD ITEMS

*Especielly for SHEET METAL DOORS  
OF UTILITY BODIES, TANK BODIES etc.  
Most Items are New ... all Thoroughly Tested*



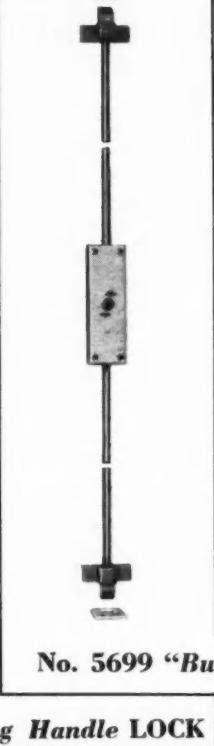
**No. 5613**  
**Slam Action**  
**LOCK**

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Spring holds handle in folded position. Rod guides fitted with anti-rattle springs. Can be mounted near edge of door.



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With Spring Action Center Case. Improved Design



**No. 5612**  
**LOCK**  
**HANDLE**  
**Without Escutcheon**

Installs easily on thick or thin sheet metal doors.



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## DELCO HEAVY-DUTY BATTERIES

For efficiency and economy in fleet service, Delco heavy-duty batteries are winning and holding the acceptance of more and more cost-wise operators. Here are batteries built to stand up under the increasing demands now being made on the electrical equipment of commercial motor vehicles—to take more in the way of hard, constant usage, and to give more in dependable, efficient service over a long period of life.

A vast fund of experience, accumulated through the years by the world's largest

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*Delco truck and bus batteries are sold through United Motors Service branches and distributors located in all parts of the country. This wide availability is an important factor to consider when you select your equipment.*

builder of automotive electrical equipment, has been drawn upon by Delco-Remy engineers in designing Delco heavy-duty batteries. Strong, genuine hard rubber cases; heavier, long-life plates, and dual insulation are some of the factors that assure heavy-duty performance and longer life.

*Replace with a Delco heavy-duty battery* is a rule that will help you get operating economy and insure against costly tie-ups caused by battery troubles. There is a size and type for every fleet requirement, including Diesel-type batteries to meet the special needs of Diesel-powered units. Get the facts from your nearest Delco battery distributor. He will gladly arrange to have a specially trained battery expert analyze your particular requirements.



# Delco-Remy

ANDERSON, INDIANA

**World's Largest Manufacturer of Automotive Electrical Equipment**

(CONTINUED FROM PAGE 104)

dispersers," the authors declared. "Some blends tend to carry finer contamination products through the filter, and consequently the apparent condition of the oil ceases to be a direct measure of the filter efficiency. Strainer-type filters are of particular interest for use with detergent-containing oils. Since, as the power of the additive is spent, it loses its ability to keep such filters clean, some indication of the need for an oil change can be obtained by a quick

examination of the filter unit. Once sludge starts to accumulate on the strainer, the oil should be changed. However, the additive may become spent in other ways, as in corrosion-preventive ability, and hence a clean filter is not a complete index of the oil condition."

### Analyzers

A study of exhaust gas analyzers, which have become popular as engine tune-up aid during the last 10 years, was reported by J. L. Dilworth,

of Pennsylvania State College. The laboratory tests were performed at the Virginia Polytechnic Institute.

"Generally speaking," Mr. Dilworth concluded, "the thermal conductivity and catalytic types (of analyzers) are the lightest and most compact, and, in addition, they enjoy the advantage of operating satisfactorily in any position.

"It would appear from the results of these tests that, in general, exhaust gas analyzers are not precision instruments, being likely to err as much as one-half of one air-fuel ratio, even under favorable conditions. However, the instruments tested did not represent all makes and it is possible that more accurate analyzers may be available. In the main, it is improbable that the average mechanic could secure better performance than was obtained under carefully controlled laboratory conditions, however.

"All exhaust gas analyzers are calibrated for regular commercial gasolines. Any fuel whose chemical composition differs appreciably from that of ordinary gasoline will necessitate a special calibration of the analyzer."

Mr. Dilworth clarified this point in discussion, saying that an increase of octane rating by adding tetraethyl lead would not necessarily require recalibration of the instrument. However, if a large octane boost is achieved by other means involving chemical composition of the gasoline, recalibration must be made.

G. W. Lovell, of General Motors Research Laboratories, agreed with the speaker's observation that at richer mixtures the gas analyzers are more sensitive and can be made accurate, and that at leaner mixtures they are not so sensitive. However, he said, exhaust gas analyzers are useful and have their place.

Errol Gay, of Ethyl Gasoline Corp., said that for its field work his company had standardized on the thermal conductivity type of analyzer.

"We find the analyzer a valuable aid in our field work with fleet accounts," Mr. Gay declared. "Many errors in carburetor setting could be corrected if checks of the carburetor were made on the road, using an accurate exhaust gas analyzer.

"Before accurate readings can be obtained, the analyzer must be properly balanced. It is not possible to establish either full load or road load

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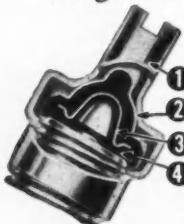
**100% PROTECTION**  
against loss of air through the valve

In winter time you want protection against road slush, snow and ice. Air-tight valve caps . . . and only air-tight valve caps can give you that protection . . . one hundred per cent!

Air-tight valve caps seal the tire valve at the mouth. They shut out all forms of road dirt, mud and slush. They prevent loss of air through the valve even if the valve

core should become damaged.

Keep a supply of air-tight caps on hand near the air stand. Sell replacements as you find them needed. This is an important safeguard to service work and it builds goodwill. And always be sure the tubes you stock have cap-sealed standard tire valves . . . your protection against customer complaints due to valve trouble.



Here's an Inside View of an Air-Tight Tire Valve Cap

- 1. Valve Cap body or shell.
- 2. Brass Swivel Plate allows Cap Shell to turn independently of rubber washer as Cap is applied. This assures proper seating of washer and prevents distortion.
- 3. Molded Rubber Washer seals valve mouth when Cap is screwed on firmly by hand; while rubber between brass plates 2 and 3 provides spring action to maintain positive seal.
- 4. Brass Dome-Shaped Plate pro-

## Schrader Tire Valve Caps

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WITH  
"RIPE TOMATO  
ACCELERATION"

WHEN you step on the accelerator and, instead of getting pep and power, it squashes to the floor like a ripe tomato—that, brother, is ripe tomato acceleration! When it happens to the little lady in the picture, it just hurts her pride and gets her red in the face. But when it happens to commercial vehicles, it means red figures and delayed deliveries. The way to put power back in your engines and stop oil pumping at the same time is to install American Hammered Piston Rings—the line with the right set-up for each engine condition and the one-and-only POWER ring in the second groove.

FOR INCREASED POWER...DECREASED OIL CONSUMPTION...IMPROVED MILEAGE, USE

American Hammered  
Piston Rings

a KOPPERS product

There is a special  
COMMERCIAL  
ENGINE SET  
for every popular  
bus and truck

(CONTINUED FROM PAGE 106)  
air-fuel ratio settings with the vehicle standing on the garage floor. The chassis dynamometer offers a more desirable method of checking air-fuel ratios without taking the vehicle on the road.

"When using our analyzers on the road, we always take our sample from a point in the exhaust line between the exhaust manifold and the muffler. This assures a sample of sufficient flow for all engine speeds and prevents any air dilution from

surge effect at the tail pipe, and also helps keep the hose free of water. Care must be taken when readings approach the 14.5 point to be sure that the air-fuel ratio is not above 15.0 to 1. Most analyzers will tend to reverse themselves as readings go above 15.0 to 1 and may at 16.0 read 14.0 to 14.5. This is usually checked by installing larger main jets until a definite move of the indicator needle in the rich direction is noted."

Mr. Gay said analyzing the exhaust of knocking or oil-hogging engines

was a waste of time and suggested several improvements.

"In 1933 the average maximum lean air-fuel ratio of six cars was 14.0 to 1. In 1940 the average of 12 cars was 15.7 to 1. There are a number of light trucks, city buses and inter-city buses using road load air-fuel ratios of 15 to 1 or higher. Therefore, we feel there is a definite need for an analyzer to read accurately to 16.5 to 1."

He indicated that such an analyzer was being readied for the market. He objected to scales that read in terms of "rich" and "lean" mixtures as being too uninformative to be of real value.

### Toll Roads

A public artery such as the Pennsylvania Turnpike is not a "toll road," which merely permits movement, but is a "super service highway" and "the fares charged are in payment for the extraordinary features offered and not for the right of movement."

On that basic premise Charles M. Noble, special highway engineer of the Pennsylvania Turnpike Commission, appealed to the truck and bus industry to support and patronize express toll highways. They may not, said he, "be an economic success unless truck and bus operators view the development with understanding and sympathy."

"Because," he argued, "rails can move goods at high speeds over long distances and assure dependable delivery in quick time, the truckmen will increasingly feel the pinch in time delays and operating costs occasioned by the deficiencies in existing highways. This pinch will first be felt in loss of cargoes to the competitive rails."

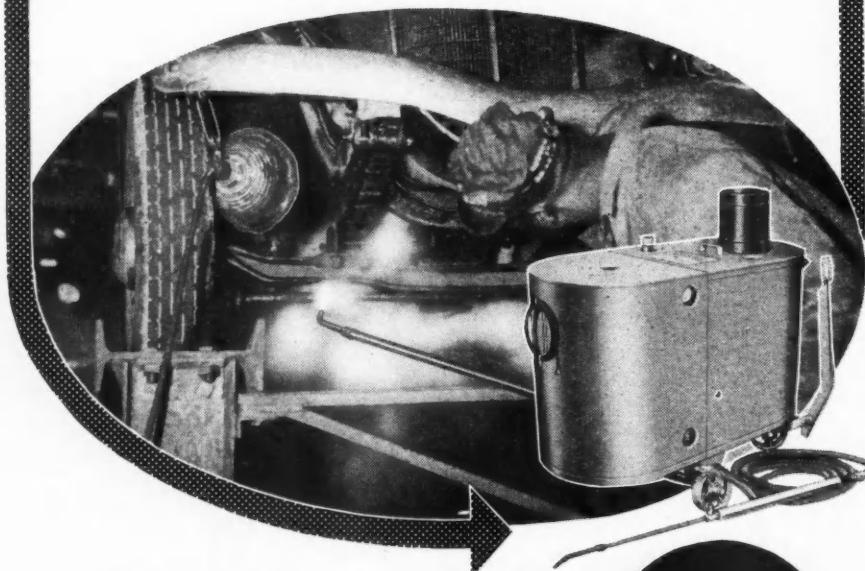
Mr. Noble agreed that the economic benefits of the express type highway would be more universally enjoyed and have a more complete economic effect on the community if such routes could be constructed out of current tax funds and thrown open to the public free of charge. Unfortunately, he said, "there does not appear much likelihood that highway departments will be able to make available the vast sums required for the construction of express routes."

The "latent hostility of passenger car owners to the presence of com-  
(TURN TO PAGE 110, PLEASE)

## Save up to 40¢ out of every repair dollar!

Where mechanics work on dirty, greasy trucks and parts, HY-PRESSURE JENNY steam cleaning before repair saves up to 40¢ out of every dollar of labor cost. HY-PRESSURE JENNY speeds the regular inspection and overhauling of your fleet. Its thorough clean-

ing prepares surfaces for repainting; discloses cracked or worn parts for repair before breakdowns occur; and increases pay loads by eliminating 50 to 400 pounds of dead-weight dirt from every truck. Find out how much HY-PRESSURE JENNY can save YOU. Send for free survey.



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O. K.—Send that Survey.

We recondition, repaint, repair.....cars or trucks monthly.

We employ.....mechanics on dirty, greasy repair work.

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TRADE-MARK REG. U. S. PAT. OFF.

A TRADE MARK THAT SPELLS  
*Quality* IN ANY LANGUAGE



THE trade-mark "TIMKEN" in conjunction

with a picture of the product which it identifies, tells a story  
that is instantly understood wherever it is seen. It means the  
"best there is" in tapered roller bearings, alloy steel, alloy  
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**THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO**

COMMERCIAL CAR JOURNAL  
FEBRUARY, 1941

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(CONTINUED FROM PAGE 108)  
mercial units on free highways" Mr. Noble held to be another reason why "it is to the interest of the truck industry to patronize toll highways as extensively as possible."

Mr. Noble stated it as a certainty that "the fares must be moderate in order to attract a sufficient volume of traffic to assure the success of an express highway system" and said it was up to the legislator and the financier to solve the problem of low interest and bond discount rates for

"these rates will determine the fare the motoring public must pay."

Mr. Noble admitted in the discussion that Pennsylvania has been in the position of keeping traffic out of the state because of its weight limits, which are lower than those of adjoining states. Legislative consideration is now being given, he said, to increasing the gross weights in Pennsylvania on certain through routes.

J. F. Winchester, of Standard Oil of New Jersey, argued that higher gross loads should be permitted on

express highways and suggested that supervising authorities might even build terminals to attract the patronage of operators and enable them to use the highway with profit.

Mr. Noble pointed out that the legal rights of the Pennsylvania Turnpike Commission are in question. State laws are held to apply to the Turnpike.

## SELL YOUR EQUIPMENT

(CONTINUED FROM PAGE 33)

will order trucking equipment in the same manner as they now order freight cars from the railroads.

It also follows that the more knowledge the traffic man has of the trucking company's equipment the more cooperative he can be when ordering necessary trucks, or the better he can protect himself in the so called "rush" periods.

A particular shipper recently had considerable difficulty in regard to the ordering of trucking equipment, a difficulty not too uncommon among other shippers. The shipper's manufacturing plant is located about 20 miles from the local office of the motor carrier he was using at that time. When a truckload shipment was ready to move it was the practice of the shipper to telephone the trucking company's office requesting that necessary equipment be placed at the company's platform for a truckload movement. Although the shipper would mention the total weight of the shipment it often developed that the entire shipment could not be loaded in one truck, requiring an additional call for a trailer. But here was the difficulty. The trucking company would often attempt to pick up the overflow or remnant with its "pick up" truck working that particular area, and in too many cases that particular truck would already be loaded to capacity. Consequently, additional equipment was still needed to complete the movement. The situation repeated itself on various occasions. The delay in getting the entire truck load to destination amounted to valuable hours, the sales manager jumped on the neck of the traffic man, and, in turn, the traffic man routed the next shipment via rail.

Investigation later developed that  
(TURN TO PAGE 112, PLEASE)

**THIS HARDIE-KELLOGG JOB  
REALY SPEEDS UP PRODUCTION  
IN THE WASH DEPARTMENT**

Because it does a faster job of washing better, the Hardie-Kellogg washer is today's number one choice. Cost-conscious operators notice, too, that it saves on labor and that cleaning solutions go further. There's a size for every need.

CUSHIONED  
AIR COMPRESSORS  
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## TESTS MEN AND SPARK PLUGS

The one plug specially engineered to give top performance in today's hotter running engines—that's the Edison HC (High Compression) Spark Plug.

Cools faster. Delivers a hotter spark at highest speeds . . . lessens "ping." Burns the charge more completely. Produces increased power and greater gas economy. Has a

longer life. And costs no more.

Put a set of Edison HC Spark Plugs in your hottest job—truck or car. You'll be dollars ahead in economy and performance.

**LEAK-PROOF GASKET** Only Edison Spark Plugs have the patented spun-on, solid copper gasket, always perfectly centered. Assures 100% compression-tight fit, throughout entire life of plugs.

A SUBSIDIARY OF  
Thomas A. Edison  
INCORPORATED  
EDISON-SPLITDORF CORP., WEST ORANGE, N. J.

# Edison SPARK PLUGS



IN ELECTRICITY, IT'S Edison FROM START TO FINISH



(CONTINUED FROM PAGE 110)

the above trucking company had an abundance of over-the-road equipment, but a shortage of smaller units, and when it was necessary to pick up remnants difficulty and delay were always the result. Secondly, no effort was made by the motor carrier to discuss with the shipper the matter of equipment and operation. The person receiving telephone calls for equipment gave only a haphazard consideration to weight, size and cubical content of the commodity to be

loaded. When the solicitor, or representative of the trucking company, called on the shipper his discussion centered entirely around the matter of rates, future business, etc. The result speaks for itself, and it is almost unnecessary to add that the next trucking company serving that shipper's plant gave a complete resume of its equipment and operating schedules.

Regardless of how one views the situation the question of operating schedules of motor transports goes

hand in hand with the ordering of equipment. Time and time again, thoughtless operating schedules have not only caused a waste of equipment, but have been factors in diverting business to other mediums of transportation.

During a recent discussion among a group of traffic men an interesting development came to my attention. It seems that a manufacturing plant located a number of miles off the main highway was experiencing complications in the daily dispatch of their shipments via motor truck. Although several trucking lines had been given the opportunity to serve the plant none of them placed a truck at a definite time during the working day—the plant was constantly unable to establish a definite schedule of dispatch. Of course, the trucking company's attitude in this regard is partly understandable; their procedure of operation did not consider the previously mentioned plant as a definite stop on their schedule, and probably directed a truck to cover the plant only when convenient with other stops enroute. On the other hand, a trucking company should not consent to handle an account unless it is willing and able to render a reasonably good service, the more so since questionable service aggravates the shipper, and in this case, the object of discussion among other shippers.

The development in the above situation was the more interesting as it unfolded. The shipper naturally did not permit such an incongruous circumstance to continue. A trucking company, outstanding in reputation, was approached and the matter of operation was discussed to the point of agreement. The result was a truck placed at the plant at a definite time each day. Gradually 3000 lb. a day grew to approximately 20,000 lb. per day. The reasons determining the increase are obvious. It was simply a matter of proper equipment and the enactment of an intelligent operating schedule conforming to the needs of the shipper.

Summing up the discussion thus far it can be said that first class equipment provides the maximum of service, and the more the shipper knows about the company's equipment the more assured he can be of receiving constantly good service.

Another reason prescribing the shipper's interest in trucking equipment  
(TURN TO PAGE 114, PLEASE)

**This Snap-on Grinder has everything!**

Plenty of protection with this guard if the wheel should blow. Safe spark shield, too!

What chance has grit got to get past this nifty anti-friction grease shield!

These wheels hold alignment! Look at the length of that flange bearing. Diamond-bored, too!

Nope! No solder. Every connection silver-brazed. Rotor plates silver-brazed. All windings varnish-baked for 8 hours.

You couldn't slip a gnat's hair between bearings and housings. The SKFs are fitted to .002".

Run it full load long as you like... windings and rotor built for continuous duty.

Adjustable double-face tool rests, also rigid base, approved cord and switch.

Husky enough to handle welds and other heavy-duty grinding . . . smooth and vibration-free in performance . . . built to stand the gaff of all-around shop work and all-day operation . . . these features earn a place for this grinder whenever time is short and tools must "tell". 1/2 H.P. 110 V. AC-DC motor is designed for continuous service without overheating, and bell-housed for handling large or odd-shaped pieces. Two 7" wheels come with each grinder. Motors wound for other than 110 V. AC-DC also available, as well as 1/4 H.P. and 1/8 H.P. models. See your Snap-on salesman or write . . .



**SNAP-ON TOOLS CORPORATION**  
Dept. CCJ-2 Kenosha, Wisconsin

**Snap-on** SERVICE TOOLS  
*The Choice of Better Mechanics*

# Studebaker introduces 3 new money-saving trucks!

*Matchless gas economy! Top quality in lowest price field!*



DE LUXE COUPE EXPRESS, ILLUSTRATED, \$689 • STANDARD MODEL, \$664

Prices delivered at factory, South Bend, Ind. Bumper guards and white sidewall tires extra

## A challenge to the most economical truck you are operating!

THIS new Studebaker Coupe Express is brilliantly engineered to cut gasoline consumption—and it saves substantial sums on oil and tires, besides.

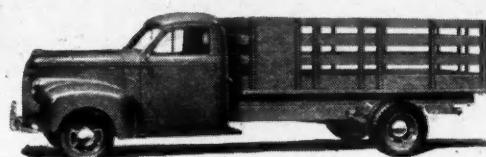
The quality of its Studebaker craftsmanship protects you against frequent, costly lay-ups for repairs.

It comes complete with a roomy, full vision cab with controlled ventilation—variable ratio steering for easier parking and sure-footed steadiness on the curves—hydraulic shock absorbers—oversize hydraulic brakes and many other economy and performance features.

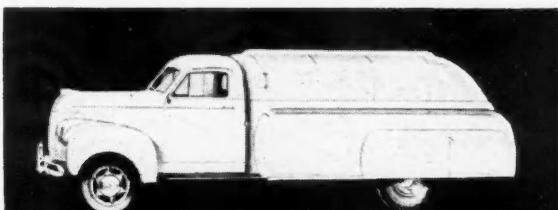
See this handsome Studebaker Coupe Express at your local Studebaker dealer's. If you need a truck of more capacity, talk to him about Studebaker's Standard or Heavy Duty models.

THE STUDEBAKER CORPORATION, SOUTH BEND, INDIANA

*The Studebaker Export Corporation, Cables: "Studebaker," South Bend, Indiana*



New Studebaker Standard Truck Series for economical transport of medium loads. Chassis prices begin at \$626 delivered at factory.



New Studebaker Heavy Duty Truck Series makes every heavy load a pay load. Chassis prices begin at \$703 delivered at factory.

Prices shown here are delivered prices at factory, South Bend, Indiana, as of January 20, 1941—subject to change without notice—Federal tax included.

(CONTINUED FROM PAGE ??)

ment has to do with the matter of claims. I don't think there is anything that is so annoying to a traffic man than to consistently receive notices of damaged merchandise, especially when many of these damages can be avoided. Considering the causes of damage claims as they specifically relate to equipment, our experience shows the following conditions as most common trouble makers:

1—Faulty interiors.

2—Worn canvas tops.

3—Tail board loading.

4—Old trucks.

5—Badly constructed supports.

The above factors, of course, give no consideration to mishandling by drivers or loaders.

Here let me mention a major item respecting equipment and operation as it relates to many over-the-road carriers. Many motor carriers of this type have trucks continually serving an important consuming area such as New York City. Their manner of

operation directs a full truckload to the terminal for redistribution throughout that area. In many instances the break-up, or local shipments, are turned over to cartage companies serving a specific county or district, such procedure being in lieu of the over-the-road carrier using smaller units themselves. While such an operation is, in most cases, satisfactory, it is nevertheless a practice demanding close attention. The service by the long haul carrier is usually beyond complaint from the time the trucks leave the originating point to destination terminal, but, and this often happens, the local cartage company in its manner of operation puts a dent in the service.

It is common knowledge that a good many of these cartage companies do the local work of many long haul carriers; they attempt to conform their operations to the unloading of the over-the-road carrier, but when shipments to a specific area are rather light they return to their own terminal, bunch the additional shipments that may be on their platforms or wait for additional tonnage before continuing enroute. The practicality of such procedure can not be questioned, yet the long-haul carrier is not getting a maximum of service to say nothing of the service accorded the shipper.

In dollars and cents value it may not seem to pay the long haul carrier to invest in further equipment for local deliveries, but many major trucking companies now stress the point that their own trucks perform all local deliveries. Such advisement on the part of trucking companies has prompted shippers to watch the situation of local deliveries very carefully. Of course, where delivery by an over-the-road carrier is accomplished through local cartage companies, without fault and delay, the shipper is not concerned with the manner of operation.

It is noteworthy that the carriers themselves made an issue of "equipment" in that a great many of them now stress the type and quantity of equipment they are ready to offer a new account. Such emphasis draws attention, and the industrial traffic man begins to look for the best in equipment insofar as it is possible to do so. Obviously, the important point is the development, on the part of the motor carrier operator, of a

(TURN TO PAGE 116, PLEASE)



**AWARD OF MERIT**—"The Clutch Specialist," published by Monmouth Products Company, received the Motor Service 1940 "Award of Merit" as an outstanding example of service literature.

## "THE CLUTCH SPECIALIST" WINS!

• The same knowledge of clutch problems and specialized engineering experience that made "The Clutch Specialist" an outstanding piece of service literature, are responsible for the exceptional quality and performance of Monmouth clutch plates and clutch parts. • To you as a mainte-

nance man "The Clutch Specialist" will prove invaluable in helping to spot and correct the clutch troubles that occur in every fleet. For complete information on "The Clutch Specialist," and on Monmouth Clutch Plates and Parts, write us, or consult your NAPA jobber.

**MONMOUTH PRODUCTS COMPANY • CLEVELAND, OHIO**  
Engine Bearings • Clutch Plates and Clutch Parts • King Bolt Sets

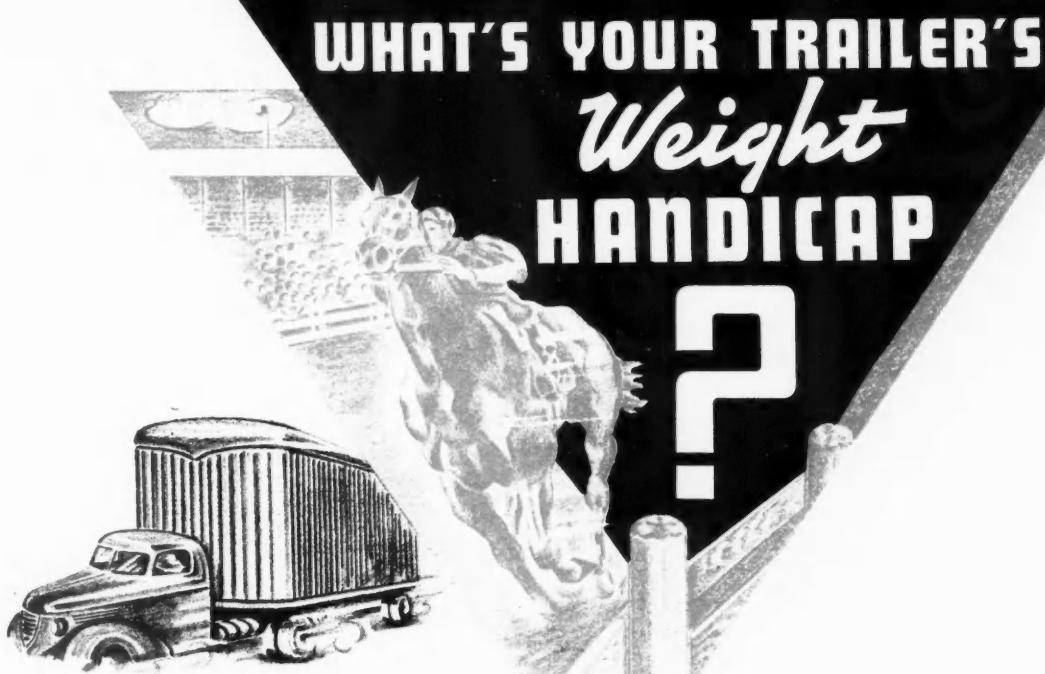


Master stocks of Monmouth Clutch Plates and Parts for all cars and trucks are maintained in NAPA Warehouses from coast to coast, assisting jobbers in every section of the country to give prompt service even on rarely called-for numbers.

*For Clutch Service*  
**Monmouth** *Is the Name!*

When writing to advertisers please mention Commercial Car Journal

COMMERCIAL CAR JOURNAL  
FEBRUARY, 1941



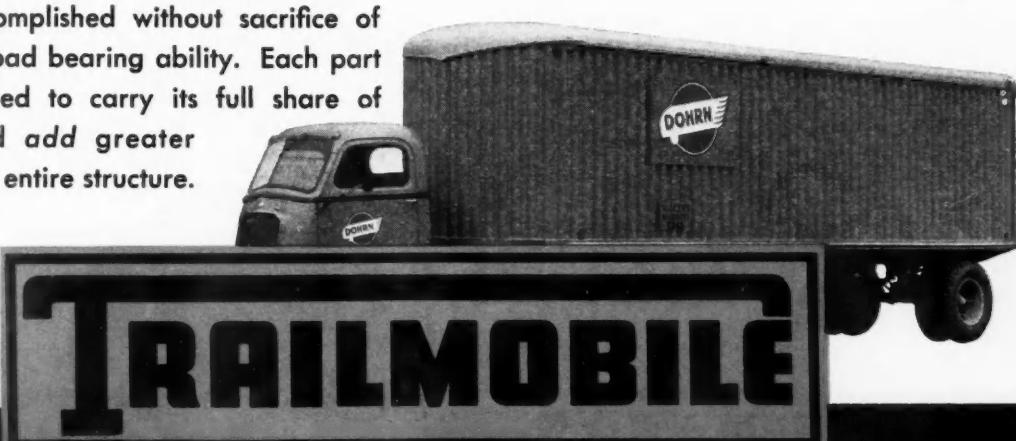
Why let excess equipment weight handicap your chances to win hauling profits?

Unnecessary weight means smaller payloads — the possibility of expensive overloads — added king-pin drag that increases oil and fuel costs. All of this you can avoid with the new Outside Frame Trailmobile — the practical freight hauling unit that safely eliminates dead weight.

This new, scientific and practical design is actually hundreds of pounds lighter than has ever been achieved before without the use of expensive alloy metals. This weight reduction has been accomplished without sacrifice of sturdiness or load bearing ability. Each part is now designed to carry its full share of the load and add greater strength to the entire structure.

There's no king pin drag because all suspension parts are "jig-assembled". The alignment is so perfect that Trailmobile rolls easily under all load and road conditions — justifies Trailmobile's reputation of being "the easy pulling trailer".

The actual scale test proves the light weight. The actual work test confirms claims for strength and roadability. Ask about these important features. Write or 'phone to company headquarters or the nearest Trailmobile office for details of how the Outside Frame Trailmobile can overcome your weight handicap.



## OUTSIDE FRAME TRAILER

THE TRAILER COMPANY OF AMERICA, CINCINNATI, OHIO  
Sales and Service Offices in Principal Marketing Centers

(CONTINUING FROM PAGE 114)  
sensible method of presenting information relative to equipment. It might be well to consider such a presentation from various angles. A logical suggestion would be for trucking operators to establish an "Official Trucking Equipment Register." Such a "Register" could be compiled in the interests of a number of carriers or issued individually. The essential information could be recorded along the lines indicated in the form reproduced on page 33.

It is interesting to observe how conveniently this information could be used by the shipper. He would have before him the power units of the trucking company he desired to use. If, for instance, his merchandise consisted of a daily 22,000 lb. load for overnight delivery to one destination, he would be in a position to judge if the available equipment, as shown in the "Register," could afford him the maximum of service. His judgment might lead him to deduct in favor of large units in view of the fact that such power can pull heavier loads, and in the event of inclement weather, the larger units might be

more practical due to better traction in holding the road.

Of the utmost importance is the data shown in the suggested "Register" relative to size and type of equipment. For example, to a shipper of valuable books, or printed matter, his main consideration would be closed top bodies, weather proof against the most driving rains or wintry storms. To the shipper of lengthy articles: pipe, iron bars, machinery, etc., particulars pertaining to open top bodies for unloading and loading by crane would be the principal objects of perusal. By observing the dimensions, as listed in the "Register," the shipper is in a position to save himself much needless labor in the event his shipping problems fall into such a category. There are many instances where the "headway" room approaching the plants of shippers require that only trucks of certain dimensions be utilized. The shipper confronted with such problems will find much to assist him in the use of a "Trucking Equipment Register." As a matter of fact, the need for "dimension" information is exemplified by many motor truck tariffs

specifying numerous cases where certain carriers will not handle "commodities" over a certain length and height. Referring to a "Register" when such situations are involved is far more simpler than "poring" over a tariff.

It will be noted that the term "optional" is suggested in connection with the age and make of trucks. Such a freedom should, of course, be the carrier's choice, especially in view of the fact that age and make of a piece of equipment, without proper maintenance, do not determine dependability. On the other hand, there seems to be a tendency, on the part of carriers, to supply shippers with information and photographs regarding age and make of trucks. Such a trend has its advantages and is a feature not to be discouraged. In reality, it is a factor that could be closely aligned to the condition of equipment. It may even be suggested that periodic records of repairs, reconditioning, etc. be supplemented to the original report of the company's equipment. Such supplementary information would serve to keep the

(TURN TO PAGE 118, PLEASE)

**THEY DON'T MEAN "MAYBE"  
WHEN THESE LAMPS  
"SHOUT" . . .**

**STOP!**

**STOP LAMPS**

MODEL No. 253 WITH 5" LENS

- TESTED
- RED OR AMBER
- BRACKET OR FLUSH MOUNTING

MODEL No. 254 WITH 7" LENS

**LARGE and EXTRA LARGE**

**IN** no uncertain terms these stop lamps halt following vehicles as "stop" appears in giant letters. Especially for school buses and other uses where caution is most imperative.

Members by invitation . . . Rice Leaders of the World Ass'n

**The K-D LAMP Co.**  
CINCINNATI, OHIO

## ANTHONY All-Purpose Low Loading DUMP BODY



Takes the place of two ordinary units

Anthony Hydraulic Hoist and Body Model D-18 especially built close to ground for easy loading, hand or machine. A Platform Body and Dump Body all in one. Sides and gate hinged for quick change. One of a complete line of Hydraulic Hoists and Bodies in capacities from 5 to 30 tons.



Model ZB Hydraulic Platform Hoist

*Left:* A powerful underbody Hoist especially built for customer's Wooden Platform Body. Requires only 13" between Body bottom and top of truck frame. Plates furnished to reinforce Body sills. For Platforms up to 12 ft. long. Write for catalog—prices on size desired.



**ANTHONY CO.**

Streator, Illinois

OF IMPORTANCE TO FLEET CAR OPERATORS

# NASH OFFICIALLY BEATS ALL OTHER 6, 8 & 12 CYLINDER CARS IN ECONOMY!

**WINNER**

In the Official 1941 Gilmore-Economy Run, the Nash "600" with Fourth Speed Forward delivered more miles to the gallon than any other 6, 8 or 12 cylinder car, averaging 25.8 Miles a Gallon at average speed of 42.6 MPH for 599 Miles.

HERE'S official proof that Nash can keep its promise of 25 to 30 miles on a gallon of gasoline.

It's a new kind of fleet car . . . designed to give the finest performance in the lowest-price field.

Built with body and frame welded into one safer, stronger, rattle-proof unit, with widest seats of any low-price car.

Powered by a new kind of engine . . . Manifold-Sealed for weather-proof starting . . . full-pressure lubricated for years of dependable duty.

Cradled on soft coil springs on all four wheels...equipped with new Two-way Roller Steering—absolutely the easiest on any car today.

And made to order for winter driving—with the Weather Eye Conditioned Air System—safe protection for drivers in cold weather.

A new Nash is at your disposal for trial and test. Write or wire W. A. Blees, Nash Motors Div., Nash-Kelvinator Corp., Detroit, Michigan.



## NOW COMPARE THIS LOWEST-PRICE NASH WITH FLEET CARS YOU'VE BEEN USING

★ BETTER ECONOMY . . . 25 to 30 miles on a gallon. Extra gas-saving Fourth Speed Forward also available.

★ GREATER SAFETY . . . one-piece welded frame and body. New Two-way Roller Steering. Sealed Beam Lights. Conditioned Air available for winter driving.

★ ROOMIER . . . Nash has greatest seating width of all low-price cars. In 2-door sedan, trunk space is 16 cubic feet, plus use of roomier interior.

★ SMOOTHER RIDE . . . Nash is only low-price car with soft coil springs on all four wheels.

★ EASIER MAINTENANCE . . . Nash super-service "Permalux" enamel exterior. All body sheet metal completely rust-proofed. No body retightening required. Coil springs never need greasing.

★ FINER ENGINEERING . . . Full pressure lubrication. Sealed-in gas and oil manifolds.

### BIG 6-PASSENGER SEDAN

(Illustrated below) Delivered at factory, including standard equipment and Federal taxes.

Weather Eye, Fourth Speed Forward, White Wall Tires, bumper Guards are optional extras.

\$745



**Go NASH**  
AND SAVE MONEY EVERY MILE

(CONTINUED FROM PAGE 116)

shipper abreast of the work the motor carrier is doing to improve and modernize his service. After all, fine running equipment gives a shipper confidence in the safe movement of his freight, and, most certainly, the receiver will appreciate the shipper's choice of a particular carrier when the truck backs to the consignee's door to make delivery. A roaring, snorting, "machine" is no credit to a shipper's judgment, or respect for his customer's merchandise, to say nothing of the possibility of protruding bolts and nails, leaky roofs, shaky sides, etc.

In proposing the adoption of a "Trucking Equipment Register" the writer has, of course, attempted to consider the proposal from a comprehensive viewpoint. It is quite obvious that there are many factors demanding consideration beyond the suggestive stage. For example, it must be carefully noted that I have not specifically suggested that a "Register" be given to traffic men in order that they might base their traffic requirements. For instance, it is not my suggestion, at this time, that a shipper refer to his "Register" and order a specific truck listed therein. But by referring to his "Register" the shipper would be in a better position than he is today to "judge" the trucking company that would best serve his interests. Of course, and this is a prediction for the future use of a "Register" a great many shippers would undoubtedly wish to use the "Register" as their basis for determining traffic requirements, and, in turn, gladly assume responsibility insofar as the ordering of equipment goes. Allow me to illustrate the point. There are many shippers who have numerous break-up cars moving via rail to focal points (New York to St. Louis, for example) who desire to make distribution via truck, say two split deliveries, and assuming their commodity to be one requiring special equipment because of dimensions, etc., it is necessary for them (the shippers) to make inquiries regarding trucking facilities in the break-up area, unless, of course, they are familiar with the area through past experience. Such inquiries usually entail a considerable amount of correspondence, to say nothing of the time involved. A "Register" or a clarified picture of the trucking facilities in all areas would do much to alleviate the prob-

lems of traffic men in this respect.

As previously mentioned the form of an "Official Trucking Equipment Register" is merely a suggestion in behalf of motor carriers. Information pertaining to equipment can also be attractively made up in pamphlet or brochure form, but the advantage in keeping the information up-to-date is in favor of the suggested register. Supplements to a register can be issued much more usefully than they can to a pamphlet or brochure.

It is essential to remember that consistent personal contacts, and the actual showing of equipment and terminals, are presentations not to be overlooked, if and when they can be accomplished.

## COLLEGE COURSE

(CONTINUED FROM PAGE 32)

pay for himself in a fleet of 50 or more vehicles. In some fleets such a man also is responsible for insurance and maintenance. Even in a small fleet of only four or five vehicles, some one person must assume full responsibility for safety. The person responsible for safety must have time for both outside and inside duties, must be a competent administrator and must have enough real authority to command the respect of all employees.

Savings from reductions in fleet accidents usually is the easiest money a company can earn. One baking company represented in the group was getting a \$4.00 return for every \$1.00 spent on safety. Comparing accident costs to sales returns, it was pointed out that this firm's driver-salesman would have to sell some 80,000 extra loaves of bread to offset one \$100.00 accident loss. Similarly, the average dairy company must sell 40,000 extra quarts of milk to pay for a \$100.00 accident; and a brewery company 350 extra barrels, or 3200 extra cases of beer.

The class discussed standardized procedures for reporting and recording accident data, and the forms recommended by the National Safety Council. Two accident report forms should be used. The driver fills out a short form at the accident scene. At the office he turns in this form and assists in preparing a more detailed long form. From this form state and municipal, Interstate Commerce Com-

mission, insurance company and other reports are prepared by the office staff.

Several students reported difficulty in getting their drivers to file accident reports. After discussion it was agreed that even the lowest class of employe could be properly trained to collect essential information at the accident scene. Many firms train their drivers by setting up mythical accident situations on a blackboard, requiring them to prepare the proper reports. When you find a fleet where drivers are not accurately reporting accidents, you also invariably find that there has been little or no training instruction. Management must take a hard-boiled attitude and accept no excuse for failure to make out accident reports. On the other hand, training classes must be conducted until there is no question about the ability of all drivers to fill out the necessary reports.

All essential information from the detailed accident report should be transferred to a tally sheet. This is usually done by a clerk and requires only five or ten minutes per report. All tally sheets then are summarized monthly and are used to develop a thorough analysis as to type of accident, location, equipment involved, time of occurrence, age and experience of drivers, weather conditions, condition of driver and vehicle, and other valuable facts. The accidents relating to the different departments, branches or types of operation, such as line-haul, pick-up and delivery, etc., may be tabulated for day-by-day or month-by-month comparison on separate tally sheets. The use of the tally sheet provides a complete picture of the progressive experience and permits prompt filing of the accident reports, or their immediate routing to other departments.

Proper analysis invariably shows that three or four major types are responsible for 60 to 70 per cent of all accidents; also, that often about one-fourth of the drivers are causing maybe three-fourths of the accidents. Thus, the person responsible for fleet safety can take immediate steps to prevent recurrence by removing the accident causes.

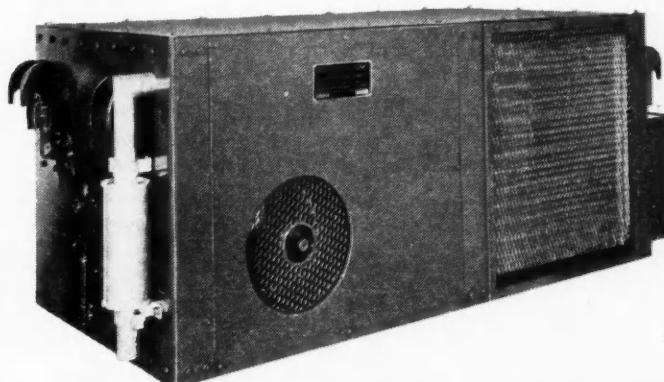
The class agreed that the company management should be kept informed on the progress of the fleet safety program through a report issued at

(TURN TO PAGE 120, PLEASE)

# REDUCE OPERATING COSTS!

## WITH THE NEW BAKER Truck Refrigerating Unit

Controlled refrigeration costs less than ever with the new BAKER Self-Powered Truck Refrigerating Unit! Increased capacity (at no increase in price) means reduced running time, which, in turn, means lower operating cost per trip. A wider range of models is also available, giving you a choice of open type (installed *inside* the trailer) or closed type (installed *beneath* the trailer). Thermostatic controls automatically maintain any selected temperature from 15° below zero to 40° above, no matter how hot the weather. The unit operates whether the truck is running or standing still, whether the trailer is coupled



to or separated from the tractor. No outside power source is needed. The unit is very compact and requires minimum space. Write today for complete information.

# BAKER

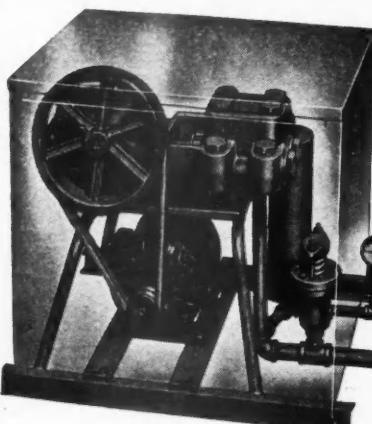
ICE MACHINE CO., INC.

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SALES AND SERVICE  
IN PRINCIPAL CITIES



AUTHORITY ON MECHANICAL COOLING FOR 35 YEARS



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Hydraulic Washer include:

- Timken Bearings
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- Compact in size—attractive protective metal hood

## New, Low Priced CURTIS Hydraulic CAR WASHERS Cut Washing Costs!

Today prices are lower than ever before for this quality equipment. You can speed up your wash jobs with a Curtis Hydraulic Car Washer because it delivers an even, powerful, fast-cleaning stream, using hot or cold water solutions. Power washing means a safer fleet, too, for it often discloses many needed under-car repairs that hand washing cannot uncover.

Investigate the savings that are possible with the Curtis Hydraulic Car Washer. Write to Curtis today for complete information and prices.



Curtis Truck and Bus Lifts—Single and Two-post Styles—6 to 10 ton capacity — Full Hydraulic — Send for Bulletin.

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ST. LOUIS NEW YORK CHICAGO SAN FRANCISCO PORTLAND

(CONTINUED FROM PAGE 118)

least once a month. It should show accident trends, costs, corrective steps taken, results accomplished, and measures soon to be put into effect. Such a report is the one factor most likely to convince management on the justification for a safety department. Often too little emphasis is placed on additional accidents not from vehicles. One large company has reported that ten per cent of their lost-time is from foot injuries in handling freight. Reports on all foot and back injuries, cuts, bruises, and similar impairments also should be kept and regularly summarized, and steps taken to prevent their recurrence.

Management should endeavor to keep the interest in safety at a fever pitch and make all employees cost-conscious of accidents. Accident reports, photographs, and instructions on how to prevent accidents should be dramatized on bulletin boards. The board should be located where employees have leisure time to take more than a passing glance, and the posted notices often changed.

Few fleets appreciate the true tangible and intangible costs of accidents. The *tangible* items include accident insurance and claim costs, repair and replacement expense, safety department expenditures, needed extra trucking equipment and personnel, legal fees and compensation expense, time lost by drivers involved in accidents, telephone calls and towing. The *intangible* cost items—often not realized at all—include failure to meet truck operating schedules, loss of customer goodwill, cost of needed extra vehicles and their abnormal depreciation, loss of skilled drivers and others, and wasted accident investigation time by company officials.

The value of photographs in accident investigation was emphasized by G. L. Van Arsdall, of Northwestern University Traffic Institute and the International Association of Chiefs of Police. Numerous fleets encourage drivers to carry cameras and take accident pictures, which pictures have safety educational value and help in settling claims. Also, the safety director and his assistants should have cameras. In taking photographs at an accident scene, the cameraman should try to picture peculiar markings on vehicles and other features to aid later vehicle identification. Per-

sons should be asked to stand at points which figured in the accident, to identify those points on the photograph. Some companies bear the expense of developing such films from drivers' cameras. Some pay 50c for each photograph accepted, and conduct free classes in photography.

In selecting drivers, never hire a person of inferior ability expecting that the company training will bring him up to standard. Check a driver's references where possible by telephone or personal interview, since former employers frequently hesitate to put on paper their frank opinion. A personal interview with the prospect is recommended, to get his attitude toward driving, and slants on his financial responsibility, home and family life, personality, etc. I.C.C. Safety Regulations require that all new drivers must pass a minimum physical examination. The class also agreed that periodic follow-up physical examinations are desirable. Many companies require fingerprints. A fingerprint form acceptable to the local, state and federal enforcement agencies should be used. All fingerprints should be checked with the proper enforcement bodies.

Although varying opinions were expressed by the class, it was pointed out that psychological tests made with mechanical equipment have yet little proved value for selecting good drivers, excepting where an applicant may be shown decidedly sub-standard in a number of tests. But tests do have value in stimulating driver interest in safety, and in pointing out deficiencies which the driver himself must correct or for which he must make compensation in safe driving.

Some companies, prior to employing a driver, require him to take three or four road test trips. Others require all new drivers to serve a short period in the garage to familiarize themselves with equipment weaknesses, truck inspection, and maintenance procedures. Some companies even require all drivers to spend at least two weeks each year in the company shop. This helps to qualify the drivers to make minor road repairs and to intelligently describe points of vehicle failure when telephoning for emergency aid. This training plan is particularly adaptable to companies which have an annual peak and slack period, mak-

ing possible more continuous employment for regular drivers. Experience proves that the regular driver invariably has a better accident record than the new employee.

R. C. Haven, Safety Engineer of Continental Baking Co., advocated careful scrutiny and handling of accident reports for each group of drivers by their immediate supervisor. When required to keep summaries on the accidents of his men, he becomes more accident-conscious and carries out a continuous program to keep his accidents to a minimum. Mr. Haven emphasized the importance of giving driver employees individual attention as against a program based entirely on the mass-action approach.

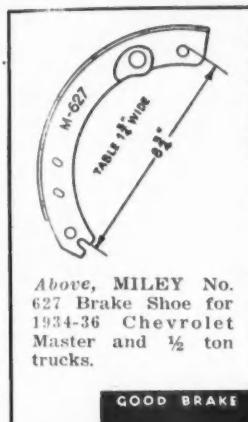
O. E. Sams of the University of Tennessee faculty, discussed public speaking. This subject was included in the curriculum because it was realized that the everyday work of the person responsible for safety has great potentialities in public relations. If he has public speaking ability he will have or can make many opportunities for talks on fleet safety and the trucking industry before various civic and other groups. Thus he will help to develop in the community a better understanding of trucking and a more sympathetic public safety attitude. The safety director who wants to become a better public speaker was advised to accept every opportunity to get on his feet, since actual practice does most to offset stage fright. He should not speak faster than 125 words per minute (Floyd Gibbons of newspaper and radio fame used to speak 300 words a minute). He should prepare well but not memorize; stand on both feet and look his audience in the eye; tell a few stories; talk in a conversational tone with his listeners and not at them.

Charles G. Morgan, Jr., Manager, Division of Operations, American Trucking Associations, Inc., discussed "The Public Relations Value of the Fleet Safety Program." Local communities are becoming increasingly interested in traffic safety and transportation. The local editor usually wants news about the local trucking companies—their safety contests, safe driving records, monthly volume of freight, special hauling jobs, highway first aid assistance, etc. This

(TURN TO PAGE 124, PLEASE)



## FOR . . . SAFER, QUIETER DELIVERY AND FEWER DELAYS, LOWER COSTS



Above, MILEY No. 627 Brake Shoe for 1934-36 Chevrolet Master and  $\frac{1}{2}$  ton trucks.

● Line your brakes with dependable, double-stopping power MILEY Linings and put a stop to delays and accidents caused by faulty brakes. Assure yourself long, trouble-free and quieter operation and lower operating costs by standardizing on the line that includes "today's linings for today's high speed overloads."

BLACK GOLD always gives a smoother pedal and lots of extra mileage because it is the densest carbon base lining manufactured. For fast, positive stopping power, use EBONITE, the high friction zinc and wire lining. Ask your MILEY distributor for brake lining information—and get the correct MILEY lining for your operating conditions.

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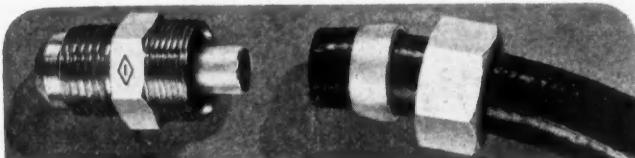
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No. 115-FN MAKE-UP KIT  
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List price of contents \$12.37

Net price to fleet owner 7.85

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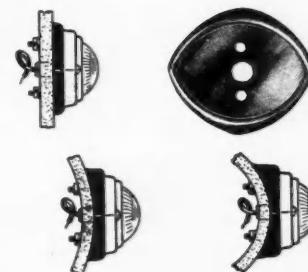
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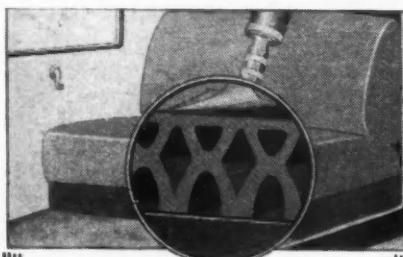
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## COLLEGE COURSE

(CONTINUED FROM PAGE 120)

kind of news helps to develop public good will for trucking and is worth while publicity for the individual company.

It was brought out that drivers' unions are helping to promote safe driving. For example, a group of unions in Pennsylvania have sponsored a state-wide Safe Drivers' Conference. In addition to instructing members in safe driving, the Conference plans to distribute community safety posters, hold a safe driving essay contest among school children, assist school safety patrols. This is being done to interest their members in safer driving and to improve public goodwill for the trucking industry and their own profession.

It was agreed during the school that many fleet safety programs fail because based too exclusively on pep talks and inspiration. There was a lively discussion about insurance companies. It was agreed that some fleet officials rely too much on the insurance carrier for the conduct of their safety program, rather than to assume the burden of their safety work themselves.

One controversial class question relating to driver training was whether a fleet operator can be held responsible for violations by his drivers of I.C.C. Safety Regulations—assuming adequate driver training and instruction. For instance, suppose a driver should loaf along over his route, and because of this loafing is on the road for too long a period of hours. Or suppose the operator has made flares, flags, fuses, and other required equipment available but the driver neglects to take them along.

It was the final general opinion that under existing interpretations the carrier is responsible. And it was generally agreed that operators in the trucking industry still have before them a big training job concerning driver knowledge about the I.C.C. safety regulations; and in seeing that their fleet safety instructions are carried out.

This problem was emphasized in a talk on "Federal Safety Regulations" by Ward Faulkner, I.C.C. District Director, Bureau of Motor Carriers. The points emphasized were brought out further by a road inspec-

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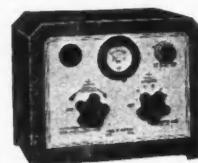
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tion of motor vehicles conducted by Safety Inspector Holden, 20 miles west of Knoxville, assisted by state enforcement officers. Some 50 persons attending the Institute watched the inspection of trucks and buses and listened to an explanation of the routine inspection procedure by Inspector Holden.

Fred Lautzenhiser, Chief Transportation Engineer, International Harvester Company, gave expert advice on "Proper Selection of Vehicular Equipment". H. L. Carr of the same company talked on "Vehicular Maintenance". The operator was advised to make a careful analysis of the service expected of his vehicles before attempting to purchase equipment. The vehicle body must be suitable to accommodate the desirable load. The chassis or tractor must be adequate to handle the load and give desirable safety factors such as hill climbing ability, braking, maneuverability, economy, etc.

"Safety — The Margin of Profit" was discussed by Harold Willings, Safety Director, Huber and Huber Motor Express, Louisville, Ky. His company has found it a good maintenance investment to test trucks for brake adjustment after each trip of approximately 600 miles, the length of their usual round trip. Invariably, some brake adjustments should be made at this mileage. Unless made, tires and brake bands come in for abnormal wear, resulting in increased maintenance expense and hazardous operation on the road.

There was considerable discussion on "accessories for safety". Safety fuel tanks were considered a worthwhile investment. Some managers of motor freight fleets make an important sales point, in talking with shippers, from the fact that their trucks are so equipped, hence the cargo is better safeguarded on the highway from the fire hazard.

As to radios, it was testified that some line-haul fleets are using them very successfully; but they are generally not being permitted on vehicles used primarily in urban operation. A radio tends to help keep the driver awake overcoming monotony and other hypnotic effects from a continuous concentration on the highway and the lighted area ahead of the vehicle, it was agreed.

Fog lights have definite advantages in areas subject to fog. They should

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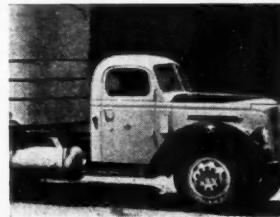


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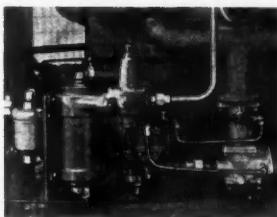
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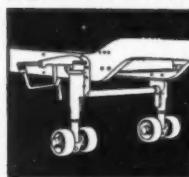
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# KATHANODE

THE DOUBLE LIFE BATTERY . . .

(CONTINUED FROM PAGE 125)

be mounted in pairs, since traffic laws require two driving lights and since they work best when the headlights are off. There should be a separate switch for the identification, clearance, marker and stop lights so they can be left on while the foglights are in operation and the headlights out. The foglight should be mounted low and aimed only 20 to 30 feet ahead.

The class generally agreed that cab heaters might be dispensed with in strictly urban operation, but are indispensable for line-haul work. There is a tendency for the heat to cause driver drowsiness, but the driver should be warned always to open the window when it becomes too hot. On the other hand, if he becomes cold he may lose many of the normal faculties necessary to safe driving. Heaters should be aimed away from the driver and the windows always should be gapped slightly.

One instance was mentioned where right-hand rear view mirrors had reduced the backing accidents of a fleet almost 40 per cent in three months. Some drivers refuse to operate semi-trailer units unless the tractor has both a right and a left-hand rear view mirror.

Many fleets have learned that there is no saving in the purchase of inferior marker, clearance or identification lights, or in endeavoring to skimp on wiring. Cheap lights and wiring are bound to cause trouble, and when they fail on the highway the driver usually is unable to repair them. Wiring placed in metal conduit seldom fails and thus requires little attention.

A new accessory was recommended which was said to discourage unsafe operating speed; and one student reported that his firm also is thus saving six to seven gallons of gasoline on runs between Chicago and St. Louis. It is a recording device which shows operating and idle time, speed, trip miles, abrupt changes in speed and which warns the driver when he exceeds some predetermined speed.

All truck and bus operators can cut maintenance costs with the original Spun Glass battery that's guaranteed longer. Kathanode Corp., Chicago.



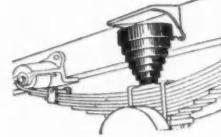
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neers Visit and Analyze Your Operation.

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It was agreed that a spotlight is a valuable safety accessory in some operations, and particularly on a bus. One large company places the spotlight on a bus on a separate circuit, protected by a fuse, so it can be put into use in case the headlights should fail. It was agreed that spotlights are advantageous for spotting curves, house numbers, etc. One of the possible hazards which drivers should be warned against is flashing a spot light in the eyes of oncoming motorists.

For the safety instruction of their



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Use Noc-Out Hose Clamps . . . the standard of the automotive industry, for quick tightening, perfect all-around seal on your hose connections. They have the extra margin of strength which makes them the leading automotive hose clamp. Type "A" Adjustable—will fit many hose sizes. Type GBB, solid band, heavy duty clamp for Booster Brakes. GHH for all types of heater hose.

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drivers, some fleets have specially prepared over-the-road route maps—with warning designations on the map to indicate low bridges, viaducts, narrow bridges or roadways, hazardous shoulders, sharp turns, etc.

Hundreds of other problems were discussed during the Second Annual Course on Vehicle Fleet Safety. It undoubtedly was one of the major courses presented during the 1940 National Institute for Traffic Safety Training. This type of instruction is needed and the commercial vehicle industry should give unqualified support to future schools.

It was observed during the sessions that commercial vehicle drivers are more than ever "on the spot". Statistics of the National Safety Council show that from 1927 to the end of 1939 the fatal accident rate for trucks decreased 29 per cent, while the accident rate of private motorists increased 18 per cent. Thus, commercial vehicle drivers are the best on the highway today.

On the other hand, fleet officials must convince their drivers that the motoring public now have come to depend on commercial vehicle drivers to drive safely, and especially because of the recent wide publicity given to them as the "gentlemen of the highway". The average private motorist often takes advantage of this expectation as an excuse to take chances himself, depending on the truck driver to prevent a smash.

Bus and truck drivers now do not dare—they cannot slacken in their safe driving efforts. They must continue to drive more and more safely!

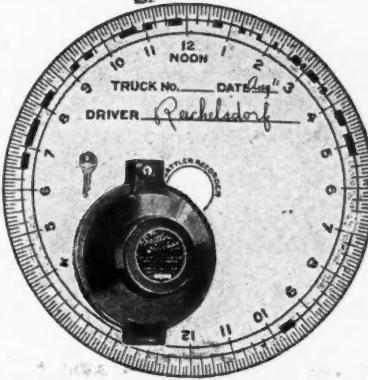
#### AFTER HOURS

(CONTINUED FROM PAGE 79)

the British railroads because they are vulnerable to attack and because they are inflexible when emergency conditions are precipitated.

An American mission is now in England studying conditions. One of its members is F. C. Horner, who is fleet transportation consultant to the National Defense Advisory Commission. We sincerely hope Mr. Horner makes it his business to find out, and that British road transport interests make it their business to acquaint him with, all the facts pertaining to the transportation situation so that this country may profit by the experiences abroad.

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This massive steam shovel is loaded on a Heavy Duty Transport Trailer equipped with husky Shuler Axles.

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Loads like this really dish out the punishment — especially to axles, which take the brunt of the beating! That's why more and more truck and trailer manufacturers are swinging over to Shuler.

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COMMERCIAL CAR JOURNAL  
FEBRUARY, 1941

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## LEGISLATIVE LOOKOUT

(Continued from Page 83)

### Indiana

H.6 and S.25 would repeal the tire weight tax for commercial vehicles.

H.9 would extend the use of license plates to March first. (Passed both houses.)

S.12 would fix a flat fee for passenger cars of \$6.00.

H.53 would fix the speed limit for passenger cars at 60 M.P.H., and for busses at 45 M.P.H. (Data for trucks not available.)

### Iowa

H.15, H.16, S.40 and S.41 would place registration fee for passenger cars between \$5 and \$15.

### Maine

S.28 would require the dimming of lights upon approaching motor vehicles.

S.86 would provide that operator's license expire one year from date of issue.

### Maryland

Governor O'Connor said that gas tax diversion had been ended and that plans were being considered for new roads between Baltimore and Washington and between Annapolis and Washington. He recommended an appropriation for an increased number of highway patrolmen. S.31 would require licensing of chauffeurs every two years.

S.34 would amend hours of duty for operators of commercial vehicles. (Details not available.)

H.96 would recommend a compulsory insurance system.

H.103 would require dimming of headlights upon approaching a motor vehicle.

H.106 would fix minimum age for operators at 18.

### Massachusetts

Governor Saltonstall recommended that more money be spent on construction of state highways and said that the State Planning Board and the Commissioner of Public Works have completed a tentative long-range program for highway construction. He also said that cities and towns should get one cent of gasoline tax revenue each year.

H.149 would authorize collection of fees for overlength permits.

H.148 would provide for collection of fees for issuance of over-weight permits.

H.150 would increase the height of "heavy-duty platform trailers."

H.208 would require posting of limits on state highways.

H.214 would require medical examinations for operators' licenses.

H.143 would require certificate to be issued to motor vehicle property carriers which must be carried at all times by the driver.

H.210 would require a helper on any commercial vehicle the body of which projects six inches beyond the operator's seat.

H.411 changes expiration of registrations to March 31.

H.493 would amend the excise tax on motor vehicles and trailers owned by corporations.

H.752 would repeal compulsory insurance law.

### Michigan

S.3 would provide a registration fee of 50c per hundred weight for farm trucks and trailers.

### Minnesota

H.19 would increase the gasoline tax to four cents.

(Turn to Next Page, Please)

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Heavy galvanized wire suspended from rings which slide on a round track. "Chain Link" weave as is used in best quality fence. Protects against theft and loss. Easy to open and close. Weave collapses within itself, saving space. Rigidly made for long, hard service, yet it is so light in total weight that average gate weighs only 90 lbs. Easily installed by owner's men. Satisfaction guaranteed. Quantity Discounts—Distributors Wanted.

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WRITE FOR FULL INFORMATION ON THE NEW J. P. BEARING HONE (PAT. NOS. 2,174,945 - 2,178,491), THE ONLY HONE OF ITS KIND ON THE MARKET. EASY TO USE—NO MOVING PARTS—COMPACT—ECONOMICAL AND CERTAIN.

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TRUCK TRANSMISSIONS

For easy shifting, quiet operation, hauling power and dependability, be sure to choose trucks equipped with FULLER'S.

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Trucks

Builders of fine Motor Trucks, Tractors, Trailers and Buses since 1910.  
Capacities from 1½ to 10 tons.  
Write for bulletin

**AVAILABLE TRUCK COMPANY**  
2501 Elston Ave. Chicago, Illinois

(Continued from Page 131)

**Montana**

Governor Ford recommended enactment of a driver's license law and a thorough study of long-range highway program.

H.42 would require carriers to report motor fuel transported.

H.1018 would impose a two per cent sales tax including transportation receipts.

**Nebraska**

Bill 10 would abolish the Railway Commission and substitute a five-man Public Utilities Commission.

Bill 13 would repeal the "port of entry" laws.

**New Hampshire**

S.5 would provide \$25 fine and possible suspension of license for failure to dim headlights.

H.62 would repeal financial responsibility laws.

**New York**

S.7 and H.136 would require motor vehicle registration to show color of vehicle.

H.1 would change the registration date to Feb. 1.

H.5 would provide a flat registration fee for passenger cars of \$5.00.

S.150 would fix a new schedule of speed limits and would authorize the Motor Vehicle Commissioner to designate official stations for testing speedometers.

H.93 would provide a compulsory semi-annual inspection of brakes and equipment by state-operated inspection stations.

H.156 and S.65 would impose a 3 per cent sales tax including first registration of motor vehicle.

H.164 would require directional signals on motor vehicles registered after Jan. 1, 1942, if manufactured after that date.

H.156 would require that trucks, busses and trailers be equipped with rear bumpers not over 20 inches above the highway surface. Effective date July 1, 1941.

H.160 would require the filing of a duplicate copy of certificate of sale of second-hand vehicles with the Motor Vehicle Commissioner.

**North Carolina**

Governor Broughton advocated rebuilding of parts of the primary road system and opposed diversion of any kind.

S.5 would provide a \$5 license fee for passenger cars.

**North Dakota**

Governor recommended continuation of additional one cent gas tax and increase of driver's license fee to \$1.

**Oklahoma**

Governor Phillips recommended increasing the speed limit to 60 m.p.h. in daylight and 50 m.p.h. at night. He also recommended the use of truck transportation "to furnish us the best possible rate for transporting of produce."

H.3 would impose a 2 per cent use tax.

H.25 would license and regulate itinerant merchants.

H.65 would prohibit the use of highways to all motor vehicles with fuel tank capacity greater than 20 gal.

**Oregon**

Governor Sprague approved a proposal of the Highway Commission to increase the permitted length of motor vehicles.

S.1 would fix the speed limit at 45 m.p.h.

S.7 would increase maximum length of vehicles to 60 ft. and weight to 68,000 lb.

**Pennsylvania**

Governor James said he was asking for

**Handy**  
**SUPER SERVICER**

**Complete, FAST BATTERY SERVICE**

HANDY SUPER SERVICER is a combined Tester, Booster and Quick Charger. Compact, Portable. Tests battery in 1 min.: charges automatically at tapered rate resulting in FAST, yet SAFE, charging; battery remains in car; charging rate, 75 amps.; 115 or 230 volts. (Specify voltage when ordering.)

**\$180.00**

Complete with Bulbs, Leads and Clips.

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**CLAW**

**Double-Duty**  
**TRUCK CHAINS**

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TONAWANDA, N.Y.

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**CUTS MAINTENANCE COST**  
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"The mechanical solution for crankcase dilution."

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**AUTOPULSE**  
ELECTRIC FUEL PUMP

- Uninterrupted Schedules
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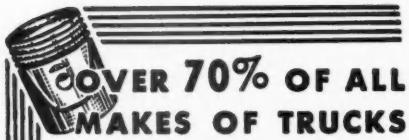
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For running-in new and rebuilt engines use auxiliary lubricants containing "dag"® Brand colloidal graphite.

Acheson Colloids Corporation

Port Huron  Michigan

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COVER 70% OF ALL  
MAKES OF TRUCKS  
AND BUSES ARE  
*Zollner* EQUIPPED  
**ZOLLNER**  
HEAVY DUTY PISTONS  
ZOLLNER MACHINE WORKS FORT WAYNE, IND.

Be Sure to Specify  
**AMERICAN BOSCH**  
Fuel Injection Equipment  
FOR DIESEL ENGINES



**AMERICAN BOSCH CORPORATION**

Springfield, Mass. New York, Chicago, Detroit.

a plan for better highway approaches to Philadelphia that would require \$10,000,000 annually for five years, and that a similar plan should be worked out for Pittsburgh. He recommended extension of the Pennsylvania Turnpike to the Ohio state line and consideration of an extension to Philadelphia.

H.21 would require carriers of inflammable liquids to file \$200,000 bond for payment of damages and limits capacity to 1000 gal.

S.22 would require operators of vehicles for hire to secure commercial operator's license at fee of \$2.

H.14 and S.30 would provide extension of the Pennsylvania Turnpike to the Ohio state line.

#### Rhode Island

H.514 would create commission to study feasibility of bridge or tunnel across Providence River.

S.12 would reduce the gas tax from 3c to 2c.

#### South Carolina

Governor Maybank recommended new one-cent gas tax to be diverted to general fund. Present tax would be reduced one cent to make the net same as before.

#### South Dakota

S.23 would require the reporting of accidents within 24 hours.

#### Tennessee

Governor Cooper said he advised no new taxes but favored retention of bridge tolls and matching of Federal aid funds from the state budget.

S.12 would impose 7c per gal. tax on soft drinks, part of proceeds to be used for highway fund.

S.57 would repeal the truck mileage tax.

S.66 would impose three per cent gross receipts tax on motor transportation in Knoxville.

#### Utah

S.18 imposes 4c per gal. tax on diesel fuel.

#### Vermont

Governor Wills asked that careful consideration be given any bill that might "unwittingly increase trade barriers."

#### Washington

S.9 would provide an additional license fee and would create an insurance fund to pay for highway injuries.

Governor Lamplie recommended reconstruction of the Tacoma Narrows Bridge.

#### West Virginia

Retiring Governor Holt recommended laws to permit cities to levy license taxes on motor vehicles.



Standard equipment for crankpins from 1 1/8" to 2 1/4" - \$35.00 f.o.b. Billings, Mont. Extra equipment for 2 5/16" and 2 3/8" crankpins - \$5.00. Net to fleet operators.

*Flash!*

"ROD BURNED OUT—  
CRANKPIN DAMAGED"

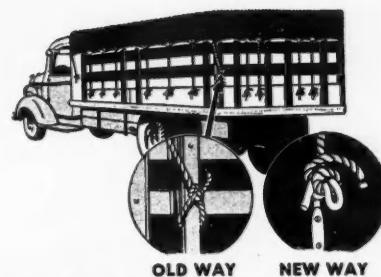
To the rescue and you're rolling again in a few hours with—

#### THE ONE-MAN CRANKSHAFT GRINDER

Here are the outstanding features:

1. Will handle any FLAT, SCORED, BABBITT-SMEARED OR TAPERED CRANKPIN WORTHY OF REPAIR.
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Mc & Mc SALES CO., BILLINGS, MONTANA



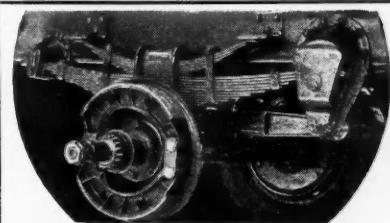
## ROP-LOC

Fastens Ropes to STAY —  
Without Knots

Here's just what you are looking for to fasten tarpaulin ropes. ROP-LOC, a simple one-piece hook, does the trick without knots. Just loop the rope around ROP-LOC and draw end tight in the gripper. Can't slip or work loose. Just as easy to release with a quick pull of the rope end. No knots to jam, swell or freeze. No flapping tarpaulins, no road delays. Easily installed on any truck or trailer with rivets, screws, bolts or welding. Fastens to rope rails with simple U-bolts. Saves time, temper and tarpaulins.

If your jobber cannot furnish write for full details and prices.

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"Ask the man who pulls one"

New Lightweight Design  
Using Hi-Tensile Steel

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*Tyson*

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300,000,000 MILE  
DEMONSTRATION**

**CUMMINS  
*Dependable*  
DIESELS**

• Owners of Cummins Diesel-powered fleets make up a "Who's Who" of the motor transport industry. These operators are using Cummins Diesel power in all types of heavy-duty equipment . . . on all kinds of operations, ranging from the long, mountainous runs to the short, stop-studded, intra-city hauls . . . because they find that Cummins Dependable Diesels assure faster, regular schedules and lower operating costs. The proof that Cummins Diesel power will give you increased profits is the Cummins Dependable Diesel's 300,000,000-mile demonstration of economy and dependability. Cummins Engine Company, 1016 Wilson Street, Columbus, Indiana.

One of four Cummins Diesel-powered units operated by Trudon & Platt Motor Lines, Bristol, Conn., is this BX Mack tractor-trailer.

Model HBS-600 (supercharged) Cummins Dependable Diesel. Horsepower: 200 at 1800 rpm.

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**All-Wheel-Drive Converted Ford**



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**For Winter Hauling—On and Off the Highway**

It is positively astonishing what a Ford truck can do when it has been converted by Marmon-Herrington to four-wheel or six-wheel *All-Wheel-Drive*.

You would never believe it was the same truck—and it isn't—because power and traction have been added to the front wheels, and the difference in performance and efficiency is immediately apparent.

For ninety per cent of the hauling jobs over American highways the standard Ford truck is all that could be desired. It is dependable, speedy, and economical.

But for the other ten per cent, the

really tough jobs, through deep mud, sand or snow, over icy pavements and steep grades—there is nothing on wheels that can equal the performance of Marmon-Herrington *All-Wheel-Drive* converted Fords.

These are the trucks you need for general hauling "across country," for road building and maintenance and for pushing snow plows. They are the trucks you need for oil service, utility work and for logging operations. The prices are surprisingly low. Write for literature. Cable address MARTON, Indianapolis, Ind.

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SEVERELY service-tested for the past year by well-known fleet operators, a single grade of a new wheel bearing lubricant has shown astonishing lubricating efficiency... in sizzling summer heat and sub-zero cold.

The name of this superior new product is *TEXACO MARFAK HEAVY DUTY*.

*Texaco Marfak Heavy Duty stays in wheel bearings*, despite the high hub temperatures, even of electric trolley buses where engine compression is not used for braking.

This newest Marfak gives thousands of extra miles of service. You repack less frequently, thus effecting desirable savings. *No seasonal changes necessary*.

Because Texaco Lubricants have proved their ability to save money for busy bus operators—

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★ More tourists use Texaco Fire-Chief Gasoline than any other brand.

★ More scheduled airline mileage within the U.S. and to other countries is flown with Texaco than with any other brand.

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Alemite 6700 Series Barrel Pumps handle all grades of fluid, plastic, and fibrous lubricants. They operate on air pressure of 75 to 175 pounds, develop 600 to 7000 pounds per square inch, deliver 5 to 14 pounds per minute, depending on piston ratio and air pressure used. Models to fit bunghole or open head drums. Write for form No. 22-23.

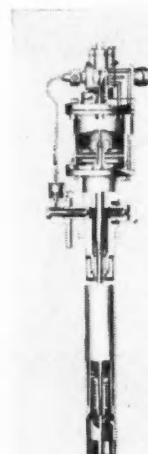
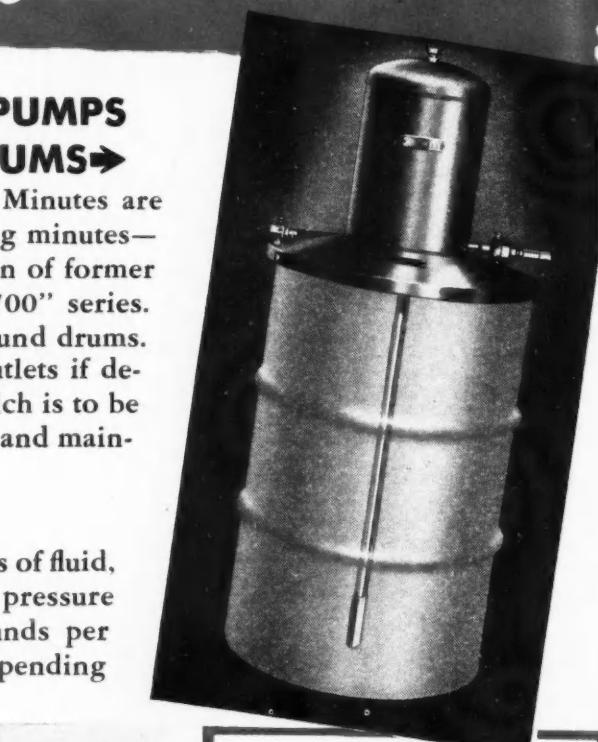
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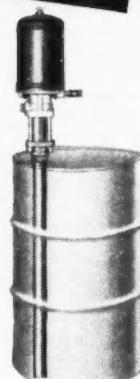
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**Model 7710  
Pneumatic  
Motor Oil  
Dispenser  
For Volume  
Delivery to  
Trucks**



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Here's quick crank-case service for your fleet! This new Alemite Model 7710 Oil Dispenser operates directly from original 55-gallon oil drums, *metering the flow accurately if desired*. Delivers SAE 10 at rate of 5 gallons per minute, SAE 60 at 3 gallons per minute with 150 pounds of air.

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-- and for Safety's Sake should be discarded

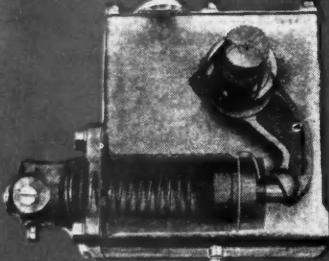


## IT PAYS to THROW AWAY WORN OUT BRAKE CYLINDERS

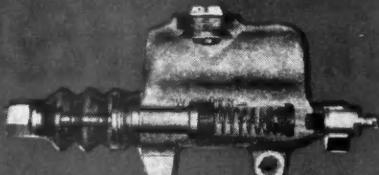
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with complete, brand new

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*made from all new parts  
factory assembled and tested*



Box Type Master Cylinder



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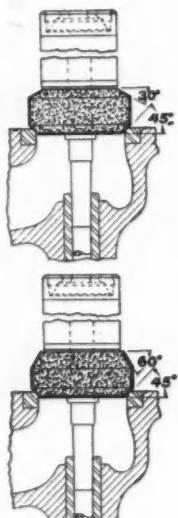
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They come in 45° or 30° and are reversible on the Holder. If one side becomes worn, the grinding wheel can be turned over and dressed down to the required angle on the other side. The 45° wheel can be turned over and dressed to 30° or 60° on the dressing tool—providing for top cut and inside narrowing or for 30° seats without buying extra grinding wheels.



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NOW, more than ever, SIOUX offers the most accurate, fastest and smoothest method of grinding valve seats. Grinds the hardest seats quickly. Perfected dual action provides a controlled fine vibration for grinding accuracy and dispersion of the cuttings — wheel mounted for full valve seat contact.

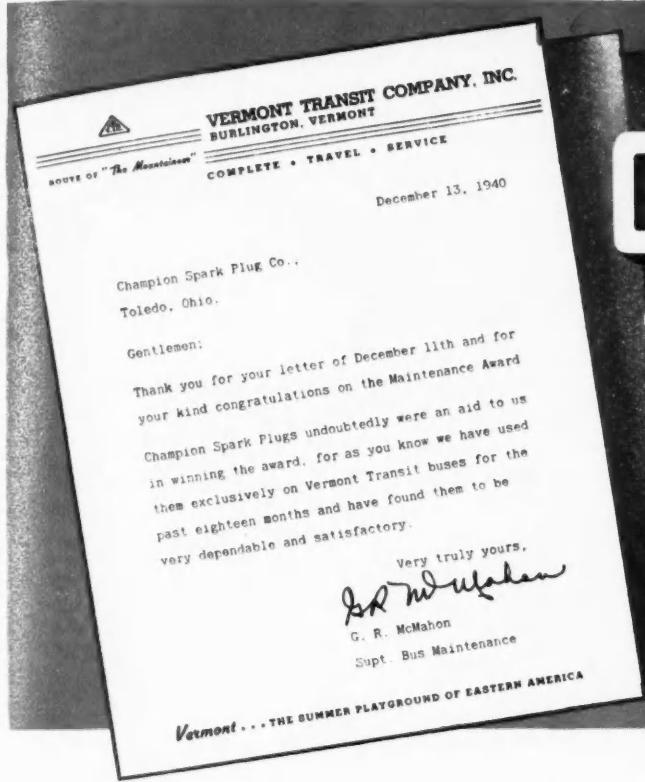
The tested and proved SIOUX Ball-Bearing Grinding Wheel Holder with hardened and precision ground inner sleeve which floats on the pilot — assures accuracy and a better finish.

ASK YOUR JOBBER'S SALESMAN

STANDARD THE  
ALBERTSON & CO., INC.



WORLD OVER  
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The placement of the engine at the rear provides amazing traction through snowdrifts and on ice. And this is a continuing advantage through the year, assuring efficient, economical performance under all operating conditions. In warmer climes and seasons there's no water to boil either.

Ask for a demonstration in your service, with your own driver at the wheel. THE WHITE MOTOR COMPANY, Cleveland.



**FOR 40 YEARS THE GREATEST NAME IN TRUCKS**



## 15% BETTER EFFICIENCY ON CONTRACTOR'S EQUIPMENT WITH STANDARD RED CROWN

Wouldn't you like to know exactly how efficient your equipment is? Gasoline mileage doesn't mean much where trucks, tractors and shovels are operated together on a job, but a Standard Automotive Engineer can tell you just how efficiently each individual unit is operating. He can also tell you why any unit is not efficient and what to do about it.

Here's an example. A Wisconsin contractor was having trouble with "vapor-lock." In addition, low gasoline mileage on his trucks suggested that fuel consumption on his tractors and shovels might also be high. A Standard Automotive Engineer surveyed the equipment with his instruments, pointed out certain mechanical troubles, and recommended Standard Red Crown gasoline.

After the changes had been made, a final analysis by the Engineer showed an average increase of 15% in efficiency in the fleet. Vapor-lock difficulties had also stopped.

To be sure that next season your equipment will be off the job as little as possible, check now with the Standard Automotive Engineer in your locality. Let him work with your maintenance men. The facilities and experience he has for accurately measuring fleet engine efficiency will be a great help in assuring you trouble-free operation next season.

Refer to the list of cities here for the Engineer nearest you.



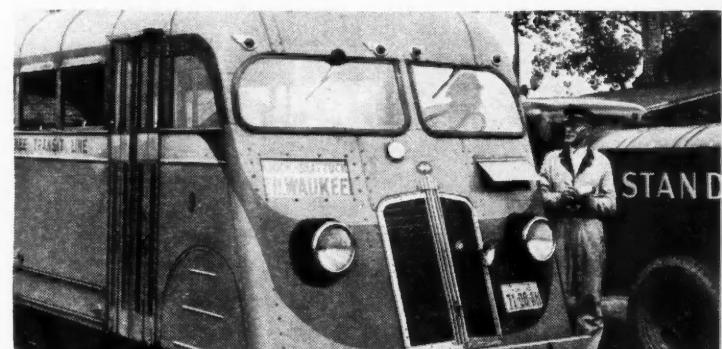
## DELIVERY FLEET GETS LONG MILEAGE AT LOW COST...USES S. O. ENGINEERING SERVICE...

One Iowa unit in a baking company system has a record for the lowest operating costs of any fleet in the company. The truck pictured below has operated 270,000 miles at a cost of approximately



2.5c per mile including fuel, lubricants, maintenance, labor and parts, and depreciation.

Even in this economically operated fleet the maintenance superintendent finds Standard Automotive Engineering service valuable. No matter how careful fleet maintenance plans are laid, problems arise periodically where the experience and special knowledge of fuels and lubricants which these Engineers have can be helpful. Their scientific methods of locating trouble are welcomed by most maintenance departments. Why don't you find out what one of these Engineers can do for you?



**BUS OPERATOR** finds Standard Red Crown and Iso-Vis Motor Oil "cannot be beat at their price." This operator is Mr. Ralph Spiekerman, owner of the Saginaw-Zilwaukee (Mich.) Bus Co. The picture shows Mr. Spiekerman, in the bus, with Standard Oil Agent Wm. Robinson. Mr. Spiekerman tried many brands of gasoline and motor oil and made his own decisions based on operating costs and reliability of operation. You can make your own comparisons, but a Standard Automotive Engineer will be glad to help.

### HERE'S WHERE YOU'LL FIND THE AUTOMOTIVE ENGINEER YOU WANT

Just call the nearest local Standard Oil (Indiana) office or write 910 South Michigan Avenue, Chicago, Illinois. In Nebraska, write Standard Oil of Nebraska at Omaha.

Billings, Mont.  
Chicago, Ill.  
Davenport, Iowa  
Decatur, Ill.  
Denver, Colo.  
Des Moines, Iowa  
Detroit, Mich.

Duluth, Minn.  
Evansville, Ind.  
Fargo, N. Dakota  
Grand Rapids, Mich.  
Green Bay, Wis.  
Huron, S. Dakota  
Indianapolis, Ind.

Joliet, Ill.  
Kansas City, Mo.  
LaCrosse, Wis.  
Mankato, Minn.  
Mason City, Iowa  
Milwaukee, Wis.  
Minneapolis, Minn.

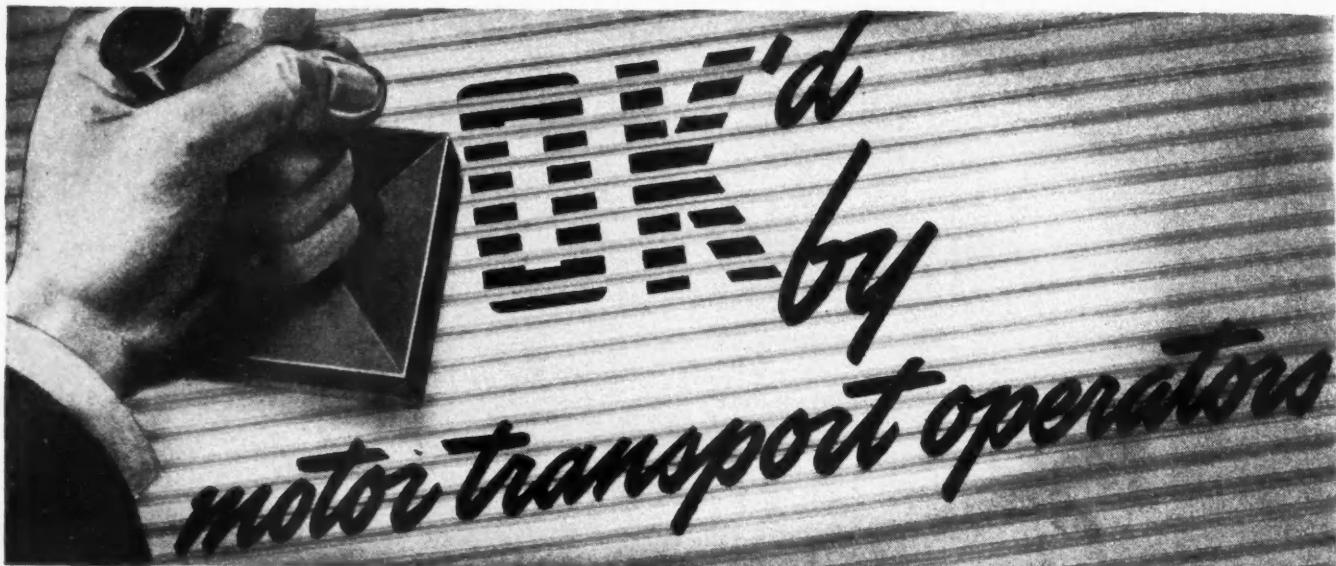
Peoria, Ill.  
Quincy, Ill.  
Saginaw, Mich.  
St. Joseph, Mo.  
St. Louis, Mo.  
South Bend, Ind.  
Wichita, Kan.

Copr. 1941, Standard Oil Co. (Ind.)

# STANDARD OIL COMPANY (INDIANA)

## LUBRICATION ENGINEERING

THE RIGHT LUBRICANT • PROPERLY APPLIED  
TO REDUCE COSTS



## REPEAT ORDERS PROVE THAT FRUEHAUF STAINLESS STEEL TRAILERS HAVE WHAT IT TAKES TO BOOST EARNINGS . . .

COST-MINDED motor transport operators have placed their stamps of approval upon Fruehauf Stainless Steel Trailers in no uncertain way. Take, for example, the successful companies whose equipment is pictured here. Every one of them—and many others—have placed repeat orders.

It is easy to understand why Stainless Steel Fruehaufs have won such widespread acceptance. Light weight in combination with exceptional strength and durability, plus the added advantage of life-long fine appearance, definitely assure peak earnings per ton hauled throughout this Trailer's unusually long life.

Stainless Steel has four times the strength of ordinary steel. Add that advantage to light weight, the fact that it is corrosion-proof (durable), has lasting fine appearance and is fabricated by the exclusive "Shotweld" method and you get a Fruehauf frame-integral unit with re-inforcing corrugated panel design that makes the ideal combination.

A Fruehauf man—a trained transportation engineer—will gladly place all the facts before you. Call him in today.

**World's Largest Builders of Truck-Trailers**  
**FRUEHAUF TRAILER COMPANY • DETROIT**  
Sales and Service in Principal Cities



**BE SURE OF THIS COMBINATION**

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- 3. DURABILITY
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**FRUEHAUF STAINLESS STEEL TRAILERS**

*When writing to advertisers please mention Commercial Car Journal*

COMMERCIAL CAR JOURNAL  
FEBRUARY, 1941



## with this UNBEATABLE PAIR!

**B**IG or small, this combination of Blackhawk Hand and Service Jacks handles 'em all. With low total investment you're ready to take on all comers — with a smooth-working service jack for quick tire changes, grease jobs and other speedy work on all pleasure cars — plus a big, powerful hand jack for heavy trucks and tractor-trailer combinations.

Blackhawk's complete line of dependable Hydraulics makes it easy pickin' to get a jack combination to fit your exact needs. Service Jacks in seven models, 1½ to 7 tons — Hand Jacks in 20 models, 1 to 75 tons. Order from your Blackhawk Jobber Salesman today. Be ready to take 'em as they come!

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### 4-TON MODEL S-4

World's finest all-purpose service jack. Built to stand the gaff of toughest heavy-duty work. Handles all light trucks and passenger cars (including Knee-action models). Has built-in Spotlight, safety Handle Lock and all other Blackhawk features.

ONLY \$59<sup>50</sup>\*

### 8-TON MODEL CB-9

Powerful, easy to operate, smooth acting, speedy — lifts truck, load and all. "Service-Proved" dependability. LOW, 9" — HIGH 19½"

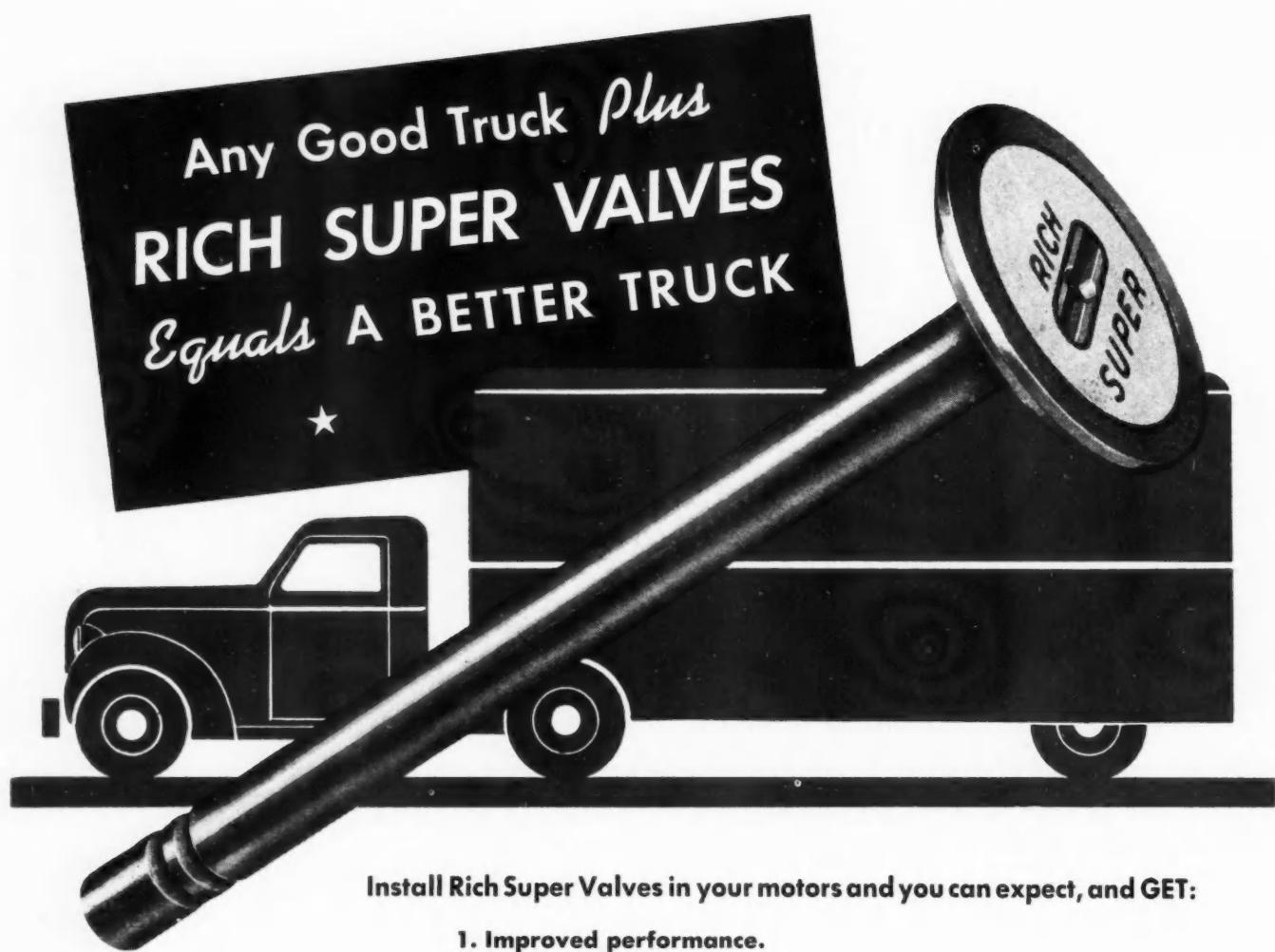
ONLY \$12<sup>95</sup>\*

\*(Slightly higher in West and Canada)



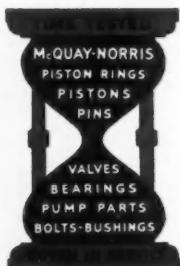
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MORE FOR YOUR MONEY SERVICE EQUIPMENT



Install Rich Super Valves in your motors and you can expect, and GET:

1. Improved performance.
2. Longer valve life.
3. More miles without service attention.
4. Lower total cost per mile.



**Why?** Because the Rich Super Valve is made of Silcrome-X Steels, famed for their ability to resist intense heat. It has a seat of Stellite—the toughest, longest-lived material ever used in valves. Users everywhere say the superiority of Rich Super Valves more than outweighs the slight difference in cost.

Install one set of Rich Super Valves; check the results. You'll agree it's a quick, easy, economical way to make any good truck a better truck! Rich Super Valves are obtainable only from your McQuay-Norris jobber.

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IN ALL PRINCIPAL CITIES. AMPLE STOCKS AND IMMEDIATE SERVICE ON THE PRODUCTS OF MCQUAY-NORRIS MANUFACTURING COMPANY, ST. LOUIS, MO.

# MAY WE SEND YOU ONE?

• **EVERY BUYER,  
BUILDER, OR USER OF  
REFRIGERATED TRUCKS  
WILL WANT A COPY  
OF THIS BOOKLET**

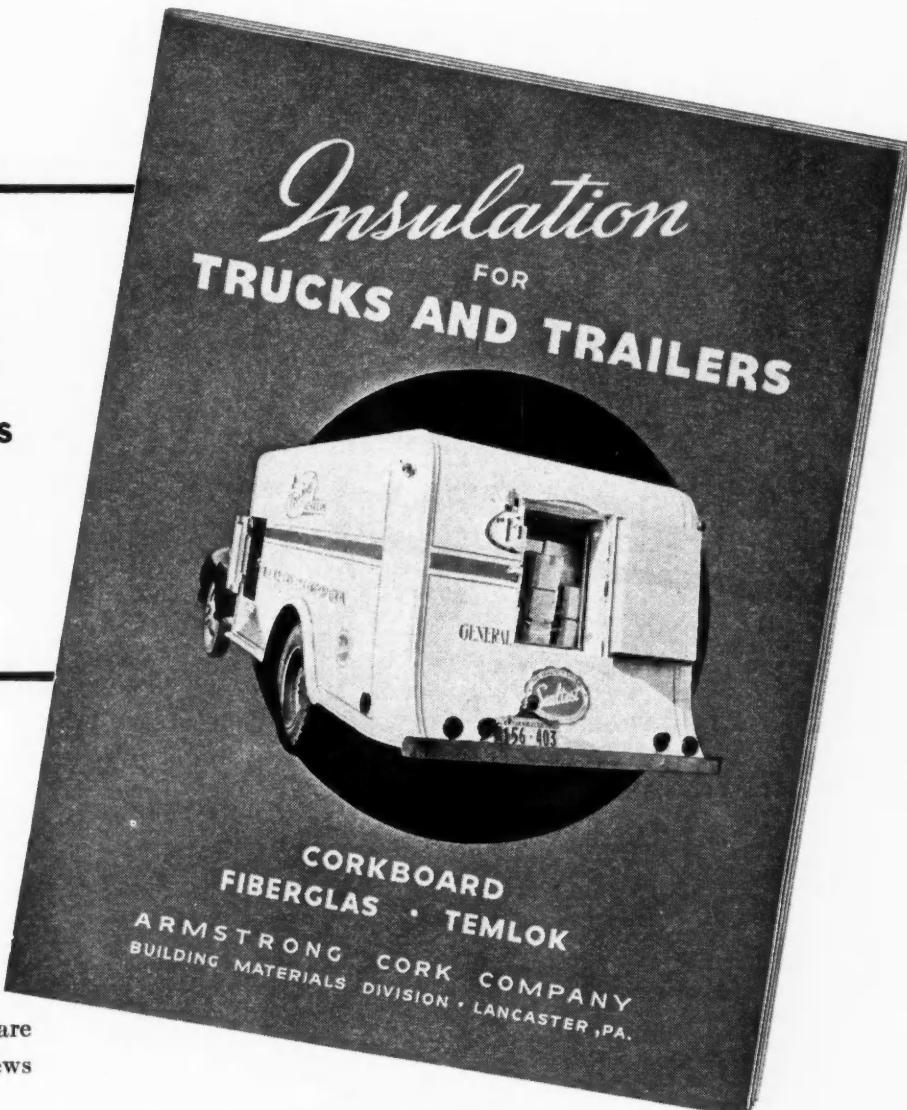
**I**N this booklet you'll find practical suggestions and detailed information on the insulation of trucks and trailers. Five large illustrations showing the application of insulation to bodies of various types are supplemented by smaller views which emphasize details.

Of particular interest and value is the Table of Physical Data on Armstrong's Insulations. This table covers LK Corkboard, Temlok, and Fiberglas.\* It gives figures on thermal conductivity, weight, sizes, recommended thicknesses for various service classifications; form; means of cutting to special shape and size; and information as to the

type of package unit as well as the quantity shipped in standard cartons.

If you buy or build insulated truck or trailer bodies you will find valuable ideas and facts in this free booklet. You can get it immediately from the Armstrong office or distributor nearest you, or by sending in the coupon printed at the right.

\* Trade-mark reg. U. S. Pat. Off.



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Gentlemen: Please send me, FREE, a copy of your new booklet "Insulation for Trucks and Trailers."

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# New INTERNATIONAL TRUCKS

See These NEW Beauties  
at the Nearest  
**INTERNATIONAL**  
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**NEW BEAUTY**, power and speed . . . new strength and endurance . . . new performance and economy . . . the *New K-Line Internationals!*

Here is an ultra-modern product superbly qualified to advance the high reputation for performance that International Trucks have maintained for more than 30 years.

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# INTERNATIONAL TRUCKS

# HOT TIP ON FLEET MANAGEMENT

OR HOW TO CUT BATTERY MAINTENANCE FROM \$6.00 TO AS LOW AS \$3.00 PER TRUCK PER YEAR

(\$6.00 average figure estimated in survey made by this magazine)



**1. The first step** is to avoid batteries whose plates look like this. Note that the active material has fallen out of the grids and is lying on the battery floor. This is often the cause of short life and many battery failures.



**2. The next step** is easy. You look for the battery names listed at the bottom of this page. Why? Because each has a Fiberglas-insulated line in which you get up to double the life and more constant power. Life-cycle tests conducted according to S.A.E. specifications prove this.



**3. Inside these** batteries are Fiberglas\* Retainer Mats. Note how the mat holds the active material on the positive plate, where it belongs. Note, too, that this mat is porous and doesn't stop the free flow of electrolyte. All of which means greatly increased battery life, maximum power, and excellent cold starting characteristics.



**4. So, don't** overlook this hot tip! Equip your fleet with batteries that have cost-cutting Fiberglas Retainer Mats—one of the greatest advances in battery design in recent years. See for yourself how your expense of battery maintenance will go down. *Owens-Corning Fiberglas Corporation, Toledo, O. In Canada, Fiberglas Canada, Ltd., Oshawa, Ont.*

\*Trade-mark Reg. U.S. Pat. Off.

*Ask your battery distributor or automotive jobber for the Fiberglas-insulated batteries in these lines: Am Plus... Autolite... Bowers... C & D... Edison... Exide... Globe... Goodrich... Goodyear... Grant... Hobbs... K & W... National... Prest-o-Lite... Philco... Price... Solar... Universal... USL... Volta... Willard*

# MACK ANNOUNCES THE NEW SCIENTIFICALLY-DESIGNED RETAILER



... for speedier deliveries at lower cost

The new Mack Retailer is unusually handy in traffic and extra easy to park because of its short overall length and 103-inch wheel-base. Compact, yet providing 280 cubic feet of *usable*, easily accessible load space, the Mack Retailer is equipped to set a new high standard of payload profit.

A six-cylinder, 210-inch engine—especially engineered for light delivery requirements—has a high compression head and special updraft manifold and carburetor for maximum fuel economy.

Built with the superior stamina for which

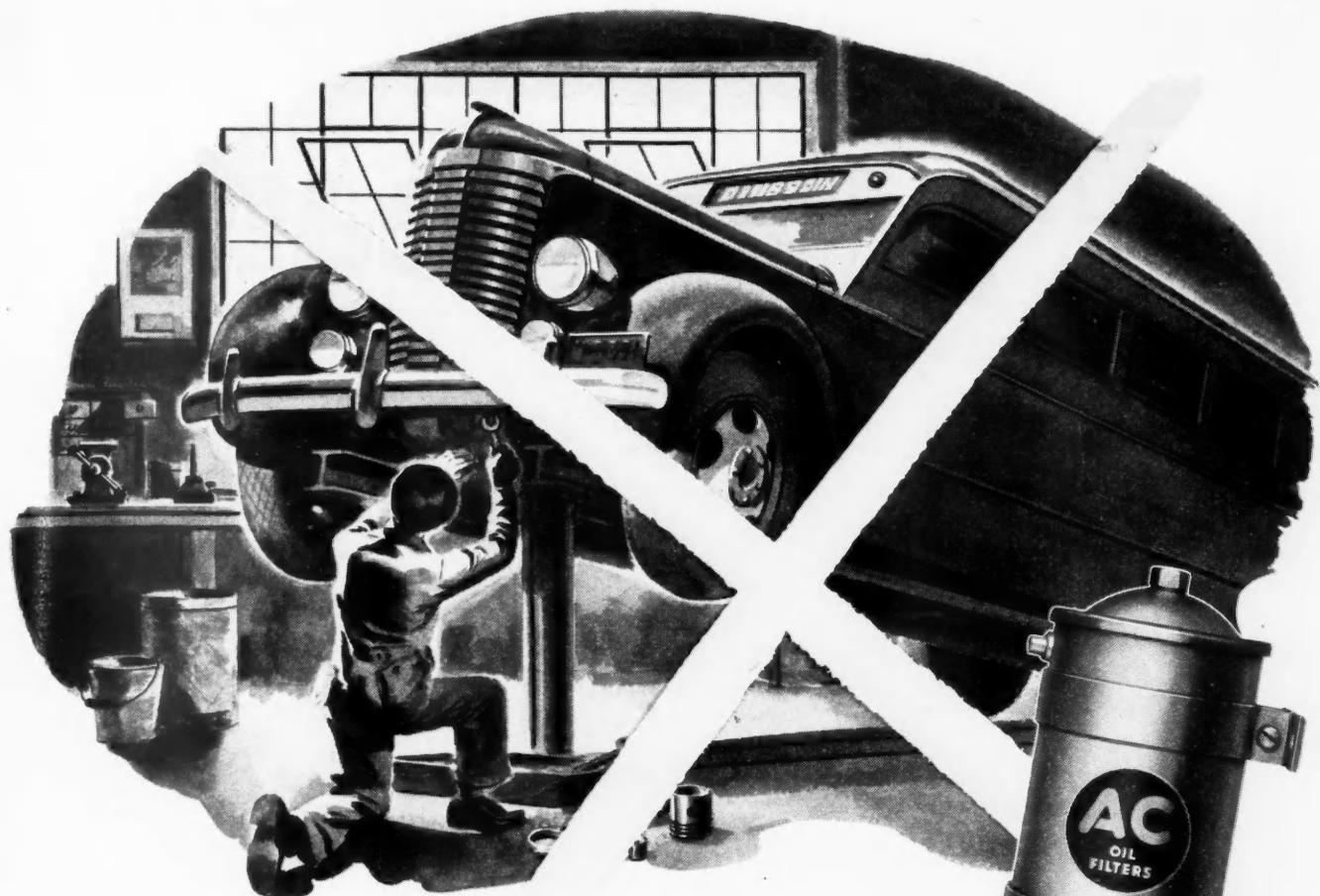
Macks are world-famous, the Retailer has an inherent ability to absorb the stop-and-go punishment of delivery service. Maintenance cost is lower, lay-up time reduced to a minimum.

Write today for complete information on this sleek, speedy, more economical light delivery truck. We shall also be glad to supply details on other Macks for other needs. Big Macks offer a choice of Thermodyne or Diesel power.

MACK TRUCKS, INC., NEW YORK, N. Y.

THE MOST COMPLETE LINE OF TRUCKS IN THE WORLD  
— 1 TO 45 TONS AND ALL "HEAVY DUTY"!

**Mack**



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**with rings kept free by AC Oil Filters**

**Here is why**—AC and Argo Oil Filters keep all sludge and dirt out of oil. Thus, they remove the substances which clog oil scraper ring slots. With the slots clear, the rings can perform their function longer. Compression is maintained longer, carbon formation is retarded, and fuel economy is sustained.

**In addition**, AC and Argo filters keep the oil in better condition, and remove discoloration.

Size for size, by actual test, AC and Argo Oil Filters are second to none in efficiency. All sizes are easily installed. Element renewal is necessary only when the oil darkens to the point at which gauge stick marks are obscured; and renewal requires no disconnection of fittings or dismounting.

Cut overhaul expense by equipping with AC or Argo Oil Filters.

**Your AC Supplier Can Furnish all Commercial Sizes**

**AC OIL FILTERS** are standard or optional equipment on—GMC TRUCKS • GREYHOUND AND FLXIBLE BUSES • ATLAS IMPERIAL AND GM DIESELS • BUICK, PONTIAC, AND OLDSMOBILE MOTOR CARS • AND OTHER VEHICLES, POWER PLANTS, AND MACHINES



**AC OIL FILTERS SAVE YOU MONEY EVERY MILE!**

# "I Can Heartily



**S**PEEDING PERISHABLE LOADS from Iowa into New York City, W.E. Hunt, refrigerated-truck operator, can't risk breakdowns. "After much experimenting," he writes, "I find Sovac Truck-Bus Oil, as recommended by your fleet engineer, gives me more trouble-free mileage than any other product I have tried.

"One of my rigs has rolled up 100,000 miles without bearing or ring replacements. The others are in comparable condition.

"For any operator who wants minimum operating costs, I can heartily recommend Socony-Vacuum's Fleet Engineering Service."



## AN INDIVIDUAL

**Y**our equipment, your routes, your operating problems—Socony-Vacuum fleet engineers study them thoroughly before making a recommendation. This is an individual service, based on your particular conditions. What can be done to help you save is indicated by the case history above . . . one of hundreds of fleet-lubrication "success stories" in Socony-Vacuum's files.

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IN A** **Socony-Vacuum**



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With time scheduled service now totaling 22,000 miles every hour Inter-State System, Detroit, offers an unusual 19 state motor freight service with a unique record of dependability. To achieve dependability with safety and economy in brakes—trailer units are equipped with **MEEHANITE** brake drums.

**MEEHANITE** is a special, metallurgically processed metal which provides a combination of properties ideal for drum service.

It is highly resistant to abrasion yet, due to the metal's structure, gives a smooth braking action which means longer lining life and freedom from scoring.

Inter-State speak from experience when they say: "Many hundred thousand miles of highway operation experience offer convincing evidence that **MEEHANITE** Brake Drums are an excellent product and we recommend their use for low cost operating efficiency."



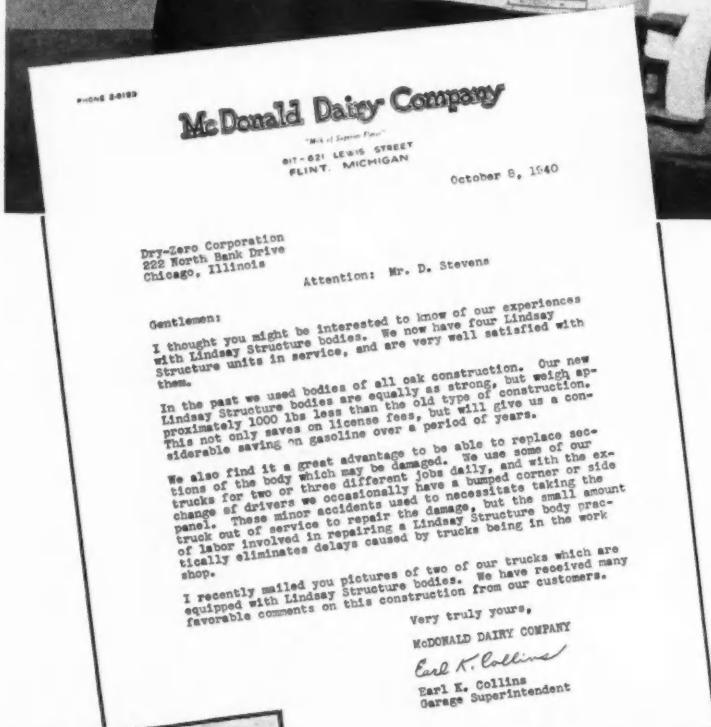
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## Lindsay Structure All-Steel Bodies Give Dairy Trucks Tremendous Strength As Well

Read this unsolicited letter and you'll discover why Lindsay Structure all-steel bodies are being adopted by truck operators everywhere. In Lindsay Structure, panel sheets are held in tension between framing members to form a body that is tremendously strong and rigid. These "pre-tensioned" sheets actually reinforce the entire framing and make unnecessary all crossbraces, gussets, and struts. This extra strength enables Lindsay Structure to withstand the severe wracking and twisting caused by heavy loads.

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ALL-STEEL  
Truck and Trailer Bodies**

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MERICAN BRAKEBLOK ENGINEERS ANNOUNCE  
AN IMPORTANT DEVELOPMENT IN BRAKE LININGS  
FOR COMMERCIAL APPLICATIONS . . .**

# **AMERICAN BRAKEBLOK LINING IN 3 Heavy Duty Types**

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Special Note: ATA, Bus Division—  
Meeting February 17th, 18th, Book-Cadillac Hotel, Detroit, Mich.

AMERICAN BRAKEBLOK engineers now offer the operators of commercial vehicles a range of brake linings which will give to every unit the maximum in braking safety and braking economy.

American Brakeblok linings in three distinct types—regular type, vacuum-booster type, air-brake type—give you the particular braking characteristics required for the *brakeload* of each vehicle in service. These three linings are engineered to load-range, speed-range and brake pressures, producing ideal brake

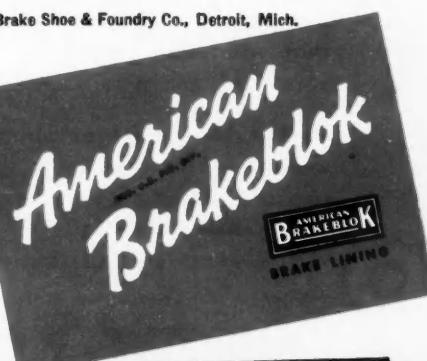
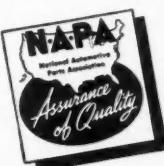
control and maximum mileage.

Send us the information covered in the form below for each of your units. The American Brakeblok engineering department will recommend the proper

AMERICAN BRAKEBLOK DIVISION of The American Brake Shoe & Foundry Co., Detroit, Mich.

Master stocks of American Brakeblok lining—in all forms—rolls, car sets and thick blocks—are maintained by 38 NAPA Ware-

houses, assisting jobbers in every section of the country to give you prompt service on all of your brake lining requirements.



No. Units Each Model	MAKE, MODEL AND YEAR	Brake Location	TYPE OF BRAKE CONTROL				LOAD		SPEED		CHARACTER OF ROUTE		
			Mech.	Hydr.	Vacuum	Air	Max.	Avg.	Max.	Avg.	Hilly	Level	Straight
		FRONT											
		REAR											
		FRONT											

# NOW! Factory-Controlled Tire Renewing *From Coast to Coast!*



**A Nation-Wide Renewing System That GUARANTEES The Same  
QUALITY • • • The Same EXTRA MILEAGE • • • EVERYWHERE**

- In New York and Pasadena, in Atlanta and Seattle, leading truck operators today are having their worn tires renewed by the uniform standards of the Kraft System. Throughout the country this new nation-wide method of factory-control renewing gives you your first positive assurance of dependable extra mileage.

Every Kraft Renewing shop uses the same factory-specified methods; the same careful "Inspect-o-scope" examination; the same exclusive Kraft Balancing; the same rigid controls every step of the way. Every shop

has the factory-trained men and the factory-approved equipment necessary to renew tires locally by the same scientific methods used by tire factories.

There is nothing else like the Kraft System for assured results in tire renewing . . . and only your General Tire Distributor has it. He alone can give you the benefits of this nation-wide system. Visit or call your General Tire Distributor today. Learn for yourself why Kraft Renewing is the proved means of cutting tire costs.

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## 23 Minutes

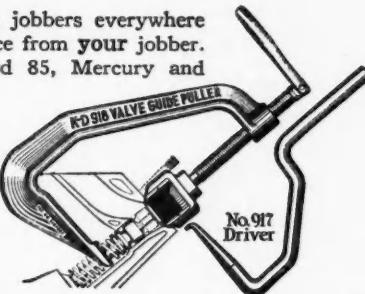
Motor man in milk fleet shop (name on request) gets V-8-85 motor for complete overhaul. Motor has gone 50,600 miles and valve guides are stuck . . . and really stuck. Man calls K-D. We take out a K-D VALVE GUIDE PULLER SET, tell man how to use it. In exactly 23 minutes all 16 assemblies are out. Think of it! 23 minutes! Man says he often wasted half a day on same job. Man bought K-D PULLER SET. Man's troubles are over. Why not you?



### K-D VALVE GUIDE PULLER SETS for all Ford-built Motors

Stocked by leading jobbers everywhere . . . get your net price from your jobber. No. 920 Set for Ford 85, Mercury and Zephyr. No. 860 Set for Ford 60.

Driver for removing guide retainer. Puller jaw fits under guides and pulls straight up when screw handle is turned. No guides too tight for these outfits!



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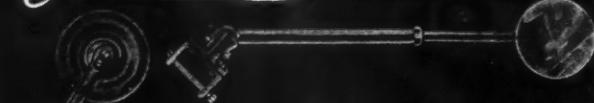
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The new, revolutionary MOTOR-O-METER and Motor Tester is here! Register your name for the first run of literature which gives amazing details!

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DEPT. C  
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Compare these Hindview advantages: (1) Easy to install...easy to adjust. (2) Wide choice of brackets, 5" and 6" mirrors. (3) Complete line...passenger cars, buses, trucks. (4) A leading name for 28 years—yet (5) Reasonably priced. See your jobber...or write Whitehead.

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Any wonder Cole-Hersee Products are used by Leading Car Manufacturers as original car equipment and are accepted standard by leading truck and trailer manufacturers.

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. . . when ordinary nuts are replaced with Stop Nuts. Used by many of the largest truck and bus fleets.



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## Elastic Stop SELF-LOCKING NUTS

## Sterling

Sterling motor trucks are engineered for the job. Specific models are offered for highway transportation, mining, quarrying, logging, stripping, excavating, etc., backed by more than 30 years' experience in the heavy duty truck field.

The only American motor truck with a shock absorbing wood-lined frame.

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**CHECK THE NUMBERS ON THE POST CARD  
MAIL IT TO US TODAY**

These numbers agree with the numbers before the paragraphs below. They are also the same as the numbers of the pages on which manufacturers' advertisements appear. Check numbers on the post card, corresponding to information desired. Mail it to us. We'll forward your request to the advertisers. Their salesmen may call on you.

## Over 100 Ways to SAVE MONEY In the Operation of Your Fleet

### Note to Advertisers and Advertising Agencies

**Forms for This Feature Close FINALLY on the 19th of the Month Preceding Publication Date. These Paragraphs Are Written from Current Advertising. Get It Here on Time.**

**FC** REO gives you custom-tailored transportation—at regular production prices. Details on the front cover. For further facts write, or check post card.

**IFC** Questions about the 1941 DODGE Job-Rated TRUCKS are answered on the inside front cover. Send for further details, or check post card.

**IBC** In planning for the future, think of aluminum as a means of making equipment lighter in weight. Read about ALCOA ALUMINUM on inside back cover. For full details write or check post card.

**BC** Speed, stamina, full four-wheel driving power, plus 1941 styling of body and chassis—that's the new FWD Model HR. Details on back cover. Write for full information, or check post card.

**1 CUMMINS Dependable DIESELS** will give you fast, regular schedules and lower operating costs. Facts on page 1. Send for literature, or check post card.

**2 MARMON - HERRINGTON All-Wheel-Drive** Converted Ford for winter hauling—on and off the highway. Facts on page 2. Write or check post card for full details.

**3 Hold down cost boosters—use DOLE By-Pass THERMOSTAT Assembly.** See page 3. Send for literature, or check post card.

**4 TEXACO announces a year 'round wheel bearing lubricant.** Details on pages 4 and 5. Write for further facts, or check post card.

**8 SIOUX Valve Seat Grinding Wheels** offer double service. Facts on page 8. Write Albertson & Co., Inc., for further details, or check post card.

**9 "Very dependable and satisfactory"** is what one fleet operator said about CHAMPION Spark Plugs. Letter on page 9. Write or check post card for further facts.

**11 STANDARD OIL** offers your fleet lubrication engineering—the right lubricant properly applied to reduce costs. Consult the nearest Automotive Engineer to you (list on page 11), or check post card for details.

**12 FRUEHAUF Stainless Steel Trailers** have won widespread acceptance—and some reasons why are to be found on page 12. Secure complete data by writing, or check post card.

**13 Big or small, the combination of BLACK-HAWK Hand and Service JACKS** handles all jobs. Pictured and described on page 13. Send for literature, or check post card.

**14 The 4 important results of installing RICH Super Valves** in your motors are given on page 14. Write or check post card for detailed information.

**15 The coupon on page 15 will bring you a free copy of ARMSTRONG'S new booklet "Insulation for Trucks and Trailers."** Or just check post card.

**16 Read about the new K-Line INTERNATIONAL Trucks** on page 16. Secure complete data by writing, or check post card.

**39 25% longer life** is built into the EXIDE Batteries of today. See page 39. Write for full details, or check post card.

**41 "Ton for Ton in '41—FEDERAL leads the way!"**—that's the FEDERAL Truck slogan on page 41. Secure complete data by writing, or check post card.

**43 "A. W."** Products have been an accepted standard for steel buyers for more than a century. See page 43. For full details write, or check post card.

**45 Read on page 45 how a New York Diesel Fleet reduces oil consumption 30% with LUBRI-ZOL.** Write for full details today, or check post card.

**46 Suggested HANSEN Hardware** for the modern body is shown on page 46. Secure complete data and catalog by writing, or check post card.

**47 OWENS-CORNING FIBERGLAS** give you a hot tip on fleet management on page 47. Write or check post card for complete data.

**57 You will find the outstanding features of the new 1941 CHEVROLET Trucks** on page 57. For detailed information write, or check post card.

**58 Your truck will "write its own diary"** when equipped with a SERVICERECORDER. See page 58. Write or check post card for additional facts.

**59 BENDIX-WESTINGHOUSE AIR BRAKES** will give your fleet economical, dependable power-to-stop. See page 59. For full information write, or check post card.

**60 Check the features of the new KINGHAM Zephyr Body** on page 60. Secure complete data by writing, or check post card.

**61 WAUKESHA Multi-Fuel ENGINES** mean less fuel, lower cost and faster hauling. See page 61. Get Bulletin 1173-A by writing, or check post card.

**62 Fleet mechanics everywhere have learned that KESTER Radiator Solder** virtually ends radiator troubles. Facts on page 62. Secure complete data by writing, or check post card.

**63 WALTER Motor Truck** 4-point positive drive gives the snow-fighter what foot-work gives the boxer. Read page 63. Write or check post card for further particulars.

**65 SEALED POWER** engineers have made it easy to put new heart, new pep, new economy into any engine. See page 65. For further facts write, or check post card.

**66 If your truck are subjected to steady, hard services, refinish them with Sherwin-Williams KEM Transport ENAMEL.** See page 66. For full data, color cards, etc., write direct, or check post card.

**67 FERODO Brake Linings** ruggedness and long life mean minimized brake maintenance cost. Facts on page 67. Write for full details, or check post card.

**68 For more than 32 years, AC has been a quality spark plug.** Interesting facts appear on page 68. For further details write, or check post card.

**69 Overhauls are less frequent with rings kept free by AC OIL FILTERS.** Why? Answer on page 69. Send for literature, or check post card.

**70 SOCONY-VACUUM** offers an individual service for your fleet on pages 70 and 71. Write today for a Socony-Vacuum Fleet Engineer to call upon you, or check post card.

**72 Your jobber has sensational news** for you on LINK-BELT Roller Bearings. See page 72. Write for complete details, or check post card.

**73 Your fleet is your outdoor advertising—keep it good looking with DeVILBISS Spray Systems.** Illustrations on page 73. Write or check post card for further information.

**74 AMERICAN SAFETY TANKS** do PREVENT fires. Read page 74 carefully. Write for full explanation, or check post card.

**75 Read the unsolicited letter** on page 75 and you'll discover why LINDSAY Structure all-steel bodies are being adopted by truck operators everywhere. Write Dry-Zero Corp. for bulletin, or check post card.

**77 On page 77 VAN NORMAN** announces and describes the new No. 555 Multi-Purpose Horizontal Surface Grinder. Write or check post card for further data.

**78 Chase REDO** is an upholstery fabric that gives real service and economy. See page 78. Send for literature, or check post card.

**79 AMERICAN BRAKEBLOK Engineers** announce an important development in brake linings for commercial applications on page 79. Send for information today, or check post card.

**80 NOW General** gives you Factory Control KRAFT SYSTEM Tire Renewing from coast to coast. Facts on page 80. Secure complete facts by writing, or check post card.

**81 The STEWART-WARNER Motor Mile Tachometer** will save your fleet fuel and oil expense. Facts on page 81. Send in coupon for further details, or check post card.

**82 Demand the A-S-F Safety FIFTH WHEEL** when you write specifications for tractors or trailers. See page 82. For details write, or check post card.

**83 WHIZ car beauty and maintenance products** can do for your fleet what it does for the U. S. Army and Navy equipment. See page 83. Secure complete data by writing, or check post card.

**84 Your mechanics will appreciate WILLIAMS' Combination Electrical Set** No. 1290-P—it gives quick service when ignition goes haywire. See page 84. Write or check post card for further details.

**85 PUSH-PULL Automotive Controls** promise a long life of smooth, free-acting, positive control. See page 85. Write American Cable Div. for details, or check post card.

**86 MIDLAND—the Air Brake Equipment with big 7.3 cu. ft. Compressor—is described on page 86.** Write or check post card for further details.

**87 Keep your oil clean with PUROLATOR.** Described and pictured on page 87. Get complete details by writing, or check post card.

**88 You can move more pay-load per dollar with TRUCKTOR-ed Six-Wheelers.** See page 88. For further information write, or check post card.

# Over 100 Ways to Save Money

(Continued from Preceding Page)

**91** RAYBESTOS Heavy Duty LININGS have a margin of safety of 300% in excess of the vehicle's normal rated capacity. Read about it on page 91. Write or check post card for the new Raybestos Truck Recommendation Guide. It's free!

**94** Don't stall and skid, keep going when others have to quit—install the THORNTON Automatic Locking DIFFERENTIAL. See page 94. Send for details, or check post card.

**95** U. S. COR-TEN assures strength and long life in high tensile steel. Read page 95 carefully. For further details write, or check post card.

**98** Before you buy—investigate the values of the EDWARDS Hi-Tensile Steel Semi-Trailers. See page 98. Write for details, or check post card.

**102** Your drivers will appreciate it if you give them Armour's HAIRFLEX in their truck cushions. Facts on page 102. For full details write, or check post card.

**103** For long life and economy, standardize on HASTINGS Steel-Vent PISTON RINGS. See page 103. Send today for full details, or check post card.

**104** The EBERHARD hardware items pictured on page 104 are all thoroughly tested and of improved design. Write or check post card for details on other products.

**105** DELCO Heavy-Duty BATTERIES are built to TAKE more and GIVE more. Details on page 105. For further facts write, or check post card.

**109** TIMKEN means QUALITY in tapered roller bearings, alloy steel, alloy steel seamless tubing, and removable rock bits. See page 109. Write for details, or check post card.

**110** The HARDIE-KELLOGG washer speeds up production in the wash department. See page 110. Write American Brake Shoe & Fdy. Co. for full details, or check post card.

**112** The SNAP-ON Grinder pictured on page 112 is described in detail. For full details on other Snap-On Service Tools write, or check post card.

**116** K-D STOP LAMPS are pictured and described on page 116. Secure complete data by writing, or check post card.

**119** New, low priced CURTIS Hydraulic CAR WASHERS cut washing costs. Outstanding features given on page 119. Write today for complete information and prices, or check post card.

**121A** If you're replacing universal joints, you need BLOOD BROTHERS Universal Joints. See page 121 and check post card for more information.

**121B** The K-D Valve Guide Fuller Set is pictured and described on page 121. Write or check post card for complete details and free Catalog.

**121C** Four of the KING BEE High Power Lamps—pictured on page 121—do the work of eight—comply with all I.C.C. Regulations. Write for catalog, or check post card.

**122A** COLE-HERSEE Products are used by leading car manufacturers and are accepted standard by leading truck and trailer manufacturers. Send for catalog "Quality Electrical Automotive Equipment" offered on page 122 or check post card.

**122B** Write for the big news in Electrical Chassis Dynamometers. See the Ted Nagle Equipment Corp. advertisement on page 122 or check post card.

**122C** Be sure to read the advantages of Whitehead's HINDVIEW MIRRORS on page 122. Write or check post card for complete details.

**122D** You'll have no more loose fastenings if you use ELASTIC STOP Self-Locking NUTS. See page 122. Write for your copy of the catalog, or check post card.

**122E** STERLING Gasoline and Diesel powered TRUCKS are built to endure. See page 122. Get complete details by writing, or check post card.

**124A** Slash maintenance cost with KARPEX Black Diamond All-Rubber SEAT CUSHIONS. Pictured on page 124. Write today for details, or check post card.

**124B** CLOYES GEARS are DESIGNED for ACCURACY. See page 124. Send for complete details, or check post card.

**124C** If you are interested in heavy duty, special trucks and generating sets, see page 124. Write DUPLEX Truck Co. for complete details, or check post card.

**124D** Free Sample to FLEET OWNERS: Self-Closing MONKEY LINKS. See page 124. White Flower City Specialty Co. today, or check post card.

**124E** Write for catalog 38AC and 38BC on FRINK SNO-PLOWS. Read page 124, or just check post card for details.

**124F** Interested in speed control without loss of power? You'll want to know more about SAFETY Speed Motor Control and SAFETY Speed Vehicle Control described on page 124. Write or check post card.

**124G** VALLEY Electric Corp., on page 124, announces its new Super-Duty Charger. Write or check post card for complete details.

**124H** Put "system" in fuel checking with BOWSER AKRAFOL Fuel Consumption Meter and you'll put dollars in your pocket. Model pictured on page 124. Send for details, or check post card.

**124I** SKF puts the right bearing in the right place. Read page 124. Write for full facts, or check post card.

**125A** Your fleet can take short cuts to savings through OAKITE cleaning. Write for free 36-page booklet offered on page 125, or check post card.

**125B** The competent engineering staff of EN-SIGN Carburetor Co.—makers of carburetors for Butane or combination Butane and Gasoline—is at your service. See page 125. Write or check post card for full details.

**126A** MCKAY Multi-Grip Double-Bar-Reinforced Truck CHAINS give double safety, positive traction, double mileage. For full details write, or check post card. See page 126.

**126B** AUSTIN offers a complete line of Landing Gears—Horizontal, Vertical and Folding Types. Write for complete information on "Safety Props" and Fifth Wheels, or check post card. See page 126.

**126C** You can cut maintenance costs with KATHANODE—the original Spun Glass Battery. See page 126. Write or check post card for more complete details.

**126D** GAR WOOD Hoists and Dump Bodies come in every size and type for every hauling job. See page 126. Send for literature, or check post card.

**126E** BORDICK Body Buoy—the auxiliary spring that floats the load—is pictured and described on page 126. Send for full details, or check post card.

**126F** DART TRUCKS—especially designed for heavy duty off-the-highway service. See page 126. Have engineer visit and analyze your operation. Write or check post card.

**127A** Read about Curran's GUNK—the high performance motor block and chassis degreaser—or page 127. Write or check post card for details.

**127B** Install LINTERN Traction Sanders NOW and avoid skids. See page 127. Secure complete data by writing, or check post card.

**127C** KINNEAR Truck Doors are convenient, burglar-proof, fire proof, and more durable. See page 127. Write for details, or check post card.

**127D** Keep your vehicles moving economically with HALL Valve Servicing Equipment. See page 127. Get complete details by writing, or check post card.

**127E** Use NOC-OUT HOSE CLAMPS for quick tightening, perfect all-around seal on hose connection. See page 116. Write Wittek Mfg. Co. for facts, or check post card.

**127F** The SATTLER Recorder gives a complete record of the work of a truck. See page 127. For further details write or check post card.

**127G** Reduce costs with RAMCO 10 up PISTON RINGS—especially built for fleet operation. See page 127. Send for complete details, or check post card.

**127H** You can depend on "HOLLAND" EQUIPMENT—built to meet the most severe and varied road conditions. See page 127. Send for catalog, or check post card.

**127I** For complete information on Precision-built AUTOCAR Trucks, write direct. (Address on page 127.) Or just check post card.

**128** SHULER AXLES are honest-to-goodness one-piece axles—made entirely from ONE piece of metal. See page 128. For full details write, or check post card.

**131A** Send today for your free wall chart offered by CARTER CARBURETOR CORP. on page 131. Or just check post card.

**131B** HEIL Hoists, Bodies and Tanks pay out in long-time service. See page 131. Write for free catalog, or check post card.

**131C** With men who know flares best, it's BOLSER—2 to 1. Read about it on page 131. Send for literature, or check post card.

**131D** The JONES Portable TACHOMETER gives you a direct, instantaneous reading. Details on page 131. Get further facts by writing, or check post card.

**131E** LIPE Heavy-Duty CLUTCHES insure maximum clutch life. Reasons on page 131. Write or check post card for more details.

**131F** Write today for details of SIGNAL-STAT Burn-Out Proof Switch and Directional Lamps, pictured on page 131. Or just check post card.

**131G** OSHKOSH 4 Wheel Drive Trucks are proven products. See page 131. Write for complete information, or check post card.

**131H** For top quality and low price, get Crescent's WIRY JOE Wire and Cable. See page 131. Get complete details by writing, or check post card.

**131I** Thirty-four years of gasket craftsmanship . . . write today for information about FITZGERALD GASKETS, OIL SEALS and GREASE RETAINERS . . . or check post card. See page 131.

**131J** Lower your filter maintenance costs with MICHIGANA Duo-Flo OIL FILTERS. See page 131. Write for Bulletin 839, or check post card.

**132A** The ATLAS Collapsible GATE protects against theft and loss, and is easy to open and close. Pictured on page 132. For full details write, or check post card.

**132B** Stop bearing troubles with J. P. Bearing Hone. See page 132. Write for full information, or check post card.

**132C** PERMALUX "Kolorilm" decals will give your fleet appearance with economy. Facts on page 132. For further facts write, or check post card.

**132D** Give your drivers the easy shifting, quiet operation, hauling power and dependability of FULLER transmissions. See page 132. Write or check post card for complete particulars.

**132E** You can find an AVAILABLE Truck for your needs—capacities from 1½ to 10 tons. See page 132. Write for bulletin, or check post card.

**132F** When you want chains, specify COLUMBUS MCKINNON Claw Double-Duty TRUCK CHAINS. See page 132. Secure complete data by writing, or check post card.

**132G** Why change oil when oil does not wear out? Read the RECLAIMO advertisement on page 132 and write for your copy of "Oil Facts." Or just check post card.

**132H** You can have fuel and maintenance economy through engine conditioning by controlled OXIDATION. See page 132. Send for details, or check post card.

**133A** Save weight with REPUBLIC double strength steel. See page 133. Write for full details, or check post card.

**133B** Look on page 133 and read the features of the AUTOPULSE Electric Fuel Pump. Write or check post card for additional information.

**133C** For running-in new and rebuilt engines use auxiliary lubricants containing "dag" brand colloidal graphite. See page 133. Write Acheson Colloids Corp. for full facts, or check post card.

**133D** Are your trucks among the 70% of all makes of trucks and buses that are ZOLLNER Heavy-Duty PISTON equipped? See page 133. Write for full details, or check post card.

**133E** Be sure to specify AMERICAN BOSCH Fuel Injection Equipment for diesel engines. See page 133. For further facts write or check post card.

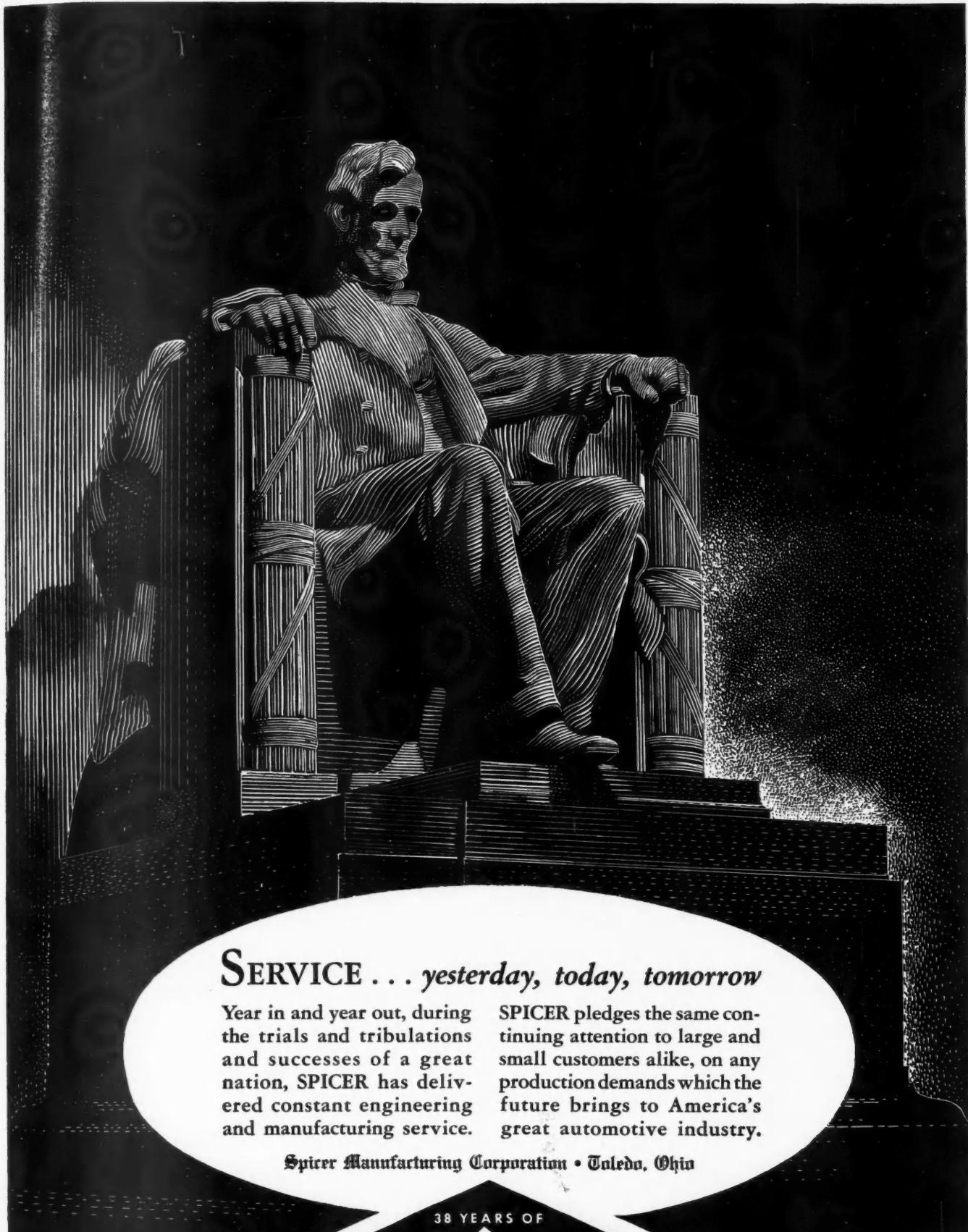
**133F** ROP-LOC fastens ropes to STAY—without knots. Facts about this Cleveland Accessories Co. product on page 133. Send for details and prices, or check post card.

**133G** P Series Timken Brakes are now standard on GRAMM TRAILERS. See page 133. Get complete details by writing, or check post card.

**133H** TYSON Roller Bearing offers Cageless for hard service—Cage-type for regular service. Write for full details (address on page 133), or check post card.

**133I** The outstanding features of the Mc & ONE-MAN Crankshaft Grinder are listed on page 133. Write for further details, or check post card.

**135** Year in and year out SPICER has delivered constant engineering and manufacturing service. See page 135. Write for details of products, or check post card.



## SERVICE . . . *yesterday, today, tomorrow*

Year in and year out, during the trials and tribulations and successes of a great nation, SPICER has delivered constant engineering and manufacturing service.

SPICER pledges the same continuing attention to large and small customers alike, on any production demands which the future brings to America's great automotive industry.

Spicer Manufacturing Corporation • Toledo, Ohio

38 YEARS OF  
**Spicer**  
SERVICE

BROWN-LIPE  
CLUTCHES and  
TRANSMISSIONS

SALISBURY  
FRONT and REAR  
AXLES

SPICER  
UNIVERSAL  
JOINTS

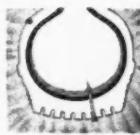
PARISH  
FRAMES  
READING, PA.

# NO "HOLD-UPS"... IF YOUR TUBES HOLD UP!



**MAXIMUM PROTECTION AGAINST  
BLOW-OUTS AND FLATS BOTH**

**IT SEALS WITH NAIL IN—**



Note how secret formula "Self-Healing" lining closes in around nail to form tight seal.

**IT HEALS WITH NAIL OUT—**



As nail is withdrawn, "Self-Healing" lining works right in to fill hole—you just keep going!

**HEALS EVEN BIG RIPS THAT  
COULD MEAN BLOW-OUT!**

Photo shows big knife-gash—"Self-Healed." Note that this highly polished tube is built round, like a tire—never sold flat, to be blown up and then weakened by stretching. 60% stronger than ordinary tubes! Like Goodrich Silvertown Tires, too, this black rubber is toughened and made extra heat-resistant with amazing Duramin.

## EQUIP WITH Seal-o-matics THE 2-WAY SAFETY TUBES THAT "HEAL THEMSELVES"...

**S**EAL-O-MATIC INNER TUBES are not only drastically reducing road delays on fleet units of all sizes—but you'd be amazed at the reports of money saved, by taxi and truck operators alike. \*One taxi fleet figures 34.6% more tire mileage, with Seal-o-matics—using the same tubes in an average of 3.6 casings each. \*A trailer fleet operator claims Seal-o-matics not only eliminated puncture troubles on the road, but increased tire mileage. \*A milk delivery fleet, using all kinds of alleys and streets, estimates "flat tire cost" reduced 75 to 80%. Just think—with ordinary tubes, even the biggest truck has no protection against a simple nail in the road! Take advantage of the confidential credit plan now offered by Goodrich Silvertown Stores and many Goodrich Dealers. Take advantage of the special bargain "change-over" deals for new fleet units. Stop in today!

\*Names and addresses furnished on request. Many other amazing experiences in the latest Seal-o-matic booklet—ask for it.



*Switch to*  
**Goodrich**  
FIRST IN RUBBER

**B.F. Goodrich Seal-o-matic Inner Tubes**

FOR PASSENGER CARS — FOR LIGHT AND HEAVY TRUCKS

THIS ISSUE OVER 30,500 COPIES

# COMMERCIAL CAR JOURNAL

THE MAGAZINE FOR FLEET OPERATORS

FEBRUARY 1941

## REO TAILORED TRANSPORTATION

Reo gives you custom-tailored transportation — AT REGULAR PRODUCTION PRICES. No longer need you buy "off the shelf". No longer need you buy trucks which are designed only in a general way for your transportation. No longer need you operate equipment which doesn't quite fit and which takes its toll in excessive costs per mile every mile traveled.

Just as the skillful tailor cuts and fits a suit of clothes, so Reo trucks are fitted to your specific requirements. Reo custom-built units will go out and do your job better, save you money, last longer, and prove a constant source of satisfaction as an investment in sound transportation. Write

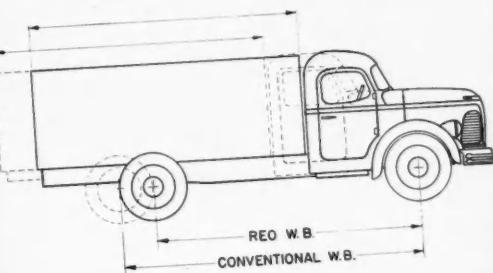
REO MOTORS, INC. • Lansing, Michigan



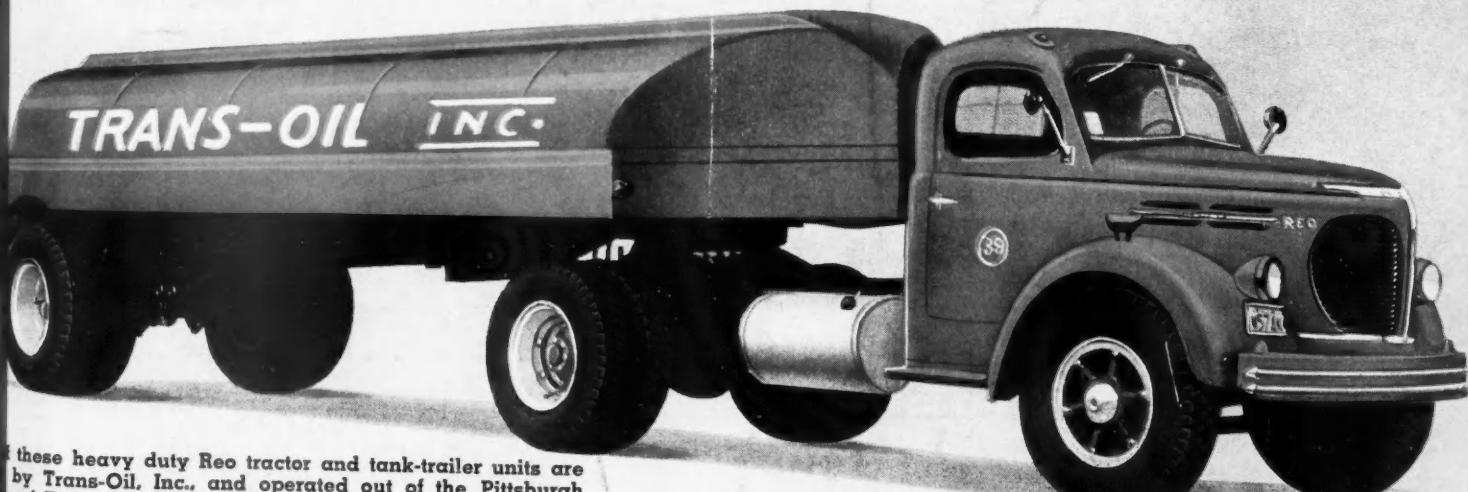
*Moreload*

SPEED WAGONS and  
HEAVY DUTY TRUCKS

### ADVANCED REO FEATURES



- ★ MORE LOAD SPACE ON SHORTER WHEELBASE
- ★ 2 to 4 FT. SHORTER TURNING RADIUS
- ★ IDEAL WEIGHT DISTRIBUTION
- ★ EXTRA HEAVY FRAMES
- ★ COMPLETE INTERCHANGEABILITY OF MECHANICAL UNITS
- ★ CAB DESIGN PROVIDING UNUSUAL DRIVER COMFORT
- ★ EXTRA LARGE SPRINGS, WHEEL BEARINGS, BRAKES, ETC.
- ★ DISTINCTIVE STYLING



These heavy duty Reo tractor and tank-trailer units are by Trans-Oil, Inc., and operated out of the Pittsburgh office of E. Brooke Matlack, Philadelphia, Pennsylvania.

# Q.

# A.

*Why are Dodge Job-Rated Trucks so economical to operate and maintain?*

*It's all a matter of quality ... plus trucks that fit the job!*

**Q.** What features of Dodge Job-Rated trucks assure high gas mileage on your job?

**A.** Each truck has the right one of six truck engines for economical power. High compression design saves on gas. By-pass thermostat reduces choking, saves fuel. Valve seat inserts and 4-ring pistons maintain compression.



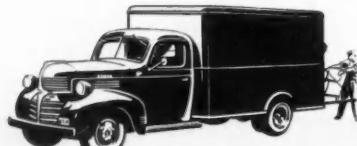
**Q.** What Dodge Job-Rated truck engine features assure top oil economy?

**A.** Full-length water jackets guard against excessive oil-burning temperatures. Two oil control rings, plus two compression rings per piston, prevent oil waste. Oil bath air cleaner contributes to longer oil life.



**Q.** What Dodge high quality engine design features reduce truck upkeep cost?

**A.** Precision-type engine bearings give longer life and low replacement cost. Superfinish on crankshaft practically eliminates wear. Water distributing tube maintains even operating temperature. Exhaust valve seat inserts reduce valve grinding.



**Q.** What Dodge quality chassis features reduce upkeep cost?

**A.** Carburized transmission gears—their extremely hard surface resists wear. Sealed roller bearing universal joints minimize friction and wear. Complete roller-bearing-equipped rear axles reduce friction, increase life.



**Q.** Why does Job-Rated mean "a truck that fits the job"?

**A.** Each Dodge truck is built throughout with the right-sized units for handling the truck's load—the right-sized engine, frame, transmission, clutch, rear axle, the right springs and the right brakes—for long life and economy of operation.



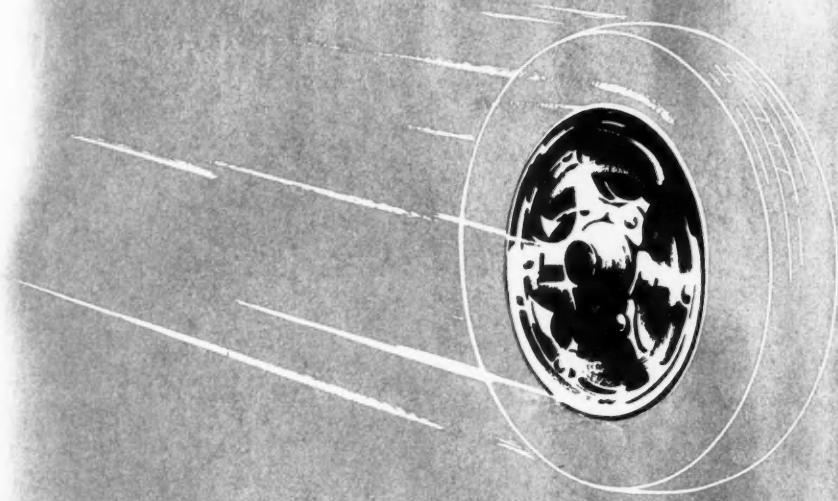
**DEPEND ON DODGE**  
*\*Job-Rated TRUCKS*

Better  
BECAUSE OF  
CHRYSLER  
CORPORATION  
ENGINEERING

*\*Job-Rated MEANS: A TRUCK THAT FITS YOUR JOB!*

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

# Here's where "running light" means money in the operator's pocket



Aluminum wheels are no idle fancy. A large number have been placed in service. Their performance in actual road work is a preview of what your lightweight wheel of the future is going to be.

Aluminum wheels go a long way toward outwitting that bogey of the chassis designer, *unsprung weight*. Their lighter weight results in less wear and tear on tires, on the engine and many

chassis parts. The operator finds his maintenance costs much less.

The Aluminum wheel is just one of the many chassis parts that will surely some day be made of

Alcoa Aluminum Alloys. In planning for the future, think of Aluminum as a means of making equipment lighter in weight.

**ALUMINUM COMPANY OF AMERICA,**  
2139 Gulf Bldg., Pittsburgh, Pa.

## DEFENSE COMES FIRST

*To meet the needs of the National Defense Program, plus the normal demands of peace, a vast expansion of our already greatly increased production capacity is being speeded. When the emergency is past, there will be more Aluminum available than ever before.*

*Meanwhile, if you can't get all the Aluminum you want when you want it, remember Aluminum is helping you by helping to meet the National emergency.*



# ALCOA ALUMINUM

# *Another Repeat Order*

51 FWD's FOR  
PENNSYLVANIA STATE  
HIGHWAY DEPT.



FWD Model HR  
3 tons capa  
equipped with  
yard dump bo

Speed . . . stamina . . . full four-wheel driving power . . . plus 1941 styling of body and chassis . . . in every detail a fine, rugged highway worker—that's the new FWD Model HR.

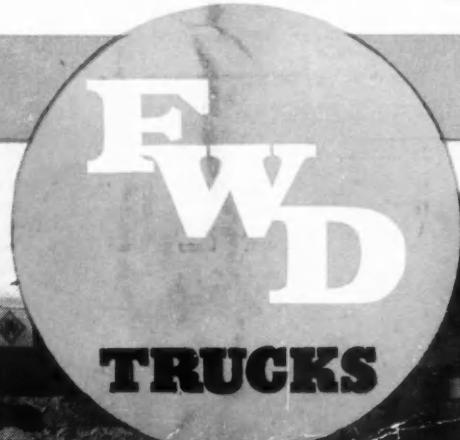
The Pennsylvania State Highway Dept. has just added 51 of these powerful FWD's to its large FWD fleet purchased over a period of years. And this is just part of the recent purchase record for FWD's for highway and airport maintenance work—8 for the new Pennsylvania Turnpike, 8 for the California State Highway Dept., 6 for the State of Delaware Highway Dept., 2 for the New Mexico State Highway Dept., 1 for the

Oklahoma State Highway Dept., 10 for the Montana State Highway Dept., 1 for the Utah State Highway Dept., 6 for the Trans-Canada Airways, 51 for the Royal Canadian Air Force, plus orders from more than 100 U. S. County Highway Depts. . . FWD's are deservedly the first choice of highway and airport men everywhere—because their full four-wheeled power enables them to do the job faster and at lower cost—no matter whether it's clearing snow, grading a road, hauling material, or towing heavy equipment. Investigate FWD trucks—write for full information today.

**THE FOUR WHEEL DRIVE AUTO CO., Clintonville, Wis.**

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